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Revision of the Species of *Pinophilus* Gravenhorst (Coleoptera: Staphylinidae) of America North of Mexico

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- CROAT, T. B. 1978. Flora of Barro Colorado Island. Stanford University Press, Stanford, Calif., 943 pp.
- GRUBB, P. J., J. R. LLOYD, AND T. D. PENNINGTON. 1963. A comparison of montane and lowland rain forest in Ecuador. I. The forest structure, physiognomy, and floristics. *Journal of Ecology*, 51: 567-601.
- LANGDON, E. J. M. 1979. Yagé among the Siona: Cultural patterns in visions, pp. 63-80. In Browman, D. L., and R. A. Schwarz, eds., *Spirits, Shamans, and Stars*. Mouton Publishers, The Hague, Netherlands.
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Revision of the Species of *Pinophilus* Gravenhorst (Coleoptera: Staphylinidae) of America North of Mexico

Abstract

The North American species of *Pinophilus* are revised and redescribed. Keys to the species and illustrations of diagnostic features are presented.

The genus *Pinophilus* Gravenhorst is represented in America north of Mexico by six species, *P. densus* LeConte, *P. diffidens* Casey, *P. gracilis* Fall, *P. latipes* Gravenhorst, *P. opacus* LeConte, and *P. parvus* LeConte. Eight previously described species of *Pinophilus* are reduced to junior synonymy. These are: *P. aridus* Casey, *P. arizonicus* Casey, and *P. pimalis* Casey (as junior synonyms of *P. densus* LeConte); *P. obesus* Casey (as a junior synonym of *P. latipes* Gravenhorst); *P. confusus* Fall and *P. parvipennis* Casey (as junior synonyms of *P. opacus* LeConte); and *P. texanus* Casey and *P. trajectus* Casey (as junior synonyms of *P. parvus* LeConte).

Introduction

The subtribe Pinophilina contains a large number of species, most of which are tropical in distribution. Approximately 452 species among 14 genera of Pinophilina have been described from throughout the world. Of these eight species and two genera (*Pinophilus* Grav. and *Lathropinus* Sharp) occur in America north of Mexico. All of them represent the northern limits of species groups whose greatest diversity occurs in Central and South America. The purpose of this paper is to redescribe the North American species of *Pinophilus* and to resolve the doubtfully valid status of several species described by Casey (1910).

Since the subject of this paper is limited to the

species of *Pinophilus* which occur in America north of Mexico, we have not examined types of all the numerous species of *Pinophilus* occurring in Central America which were described by Sharp (1886). We are not aware of synonyms of North American species included among these; however, they merit further investigation. Although this study includes only a small proportion of the total taxonomic diversity that exists within the subtribe Pinophilina, several statements about phylogenetic relationships can be suggested. These statements, however limited, will serve as a basis for additional work in this subtribe.

Since the type species of *Pinophilus*, *P. latipes*, occurs in the region under study, it is used for the most detailed morphological and descriptive treatment. All of the North American *Pinophilus* appear to be quite closely related to *P. latipes*, and, should the genus be subdivided in the New World, all of the North American species would probably be placed in *Pinophilus sensu stricto*.

Generic Classification

In addition to the genus *Pinophilus*, the genera *Araeocerus* Nordmann and *Lathropinus* Sharp have been attributed to occur in North America (Erichson, 1840; Bernhauer & Schubert, 1912; Arnett, 1968; Moore & Legner, 1975). *Araeocerus* was distinguished from *Pinophilus* based on mandible denticulation. *Pinophilus* has a well-developed median tooth on the mandible (fig. 19), and *Araeocerus* completely lacks mandibular teeth or has a very minute tooth near the base. *Lathropinus* was distinguished from *Pinophilus* by the presence of spines on the middle tibia, and by a habitus

TABLE 1. Measurements (in millimeters) of prothorax and elytra of species of *Pinophilus*.

Species	Sex	No. of specimens	PL	EL	PW	EW	PL:PW	EL:EW	EL:PL	EW:PW
<i>Pinophilus densus</i>	M	5	1.69 (.03)	2.00 (.00)	1.67 (.03)	1.86 (.05)	1.01 (.01)	1.08 (.03)	1.19 (.02)	1.11 (.02)
<i>densus</i>	F	5	1.78 (.06)	2.16 (.07)	1.75 (.09)	1.96 (.10)	1.02 (.03)	1.10 (.03)	1.21 (.03)	1.12 (.03)
<i>diffidens</i>	M	5	1.56 (.04)	1.99 (.12)	1.52 (.07)	1.63 (.03)	1.03 (.03)	1.22 (.05)	1.27 (.06)	1.07 (.03)
<i>diffidens</i>	F	4	1.58 (.03)	2.08 (.06)	1.59 (.06)	1.69 (.05)	.99 (.04)	1.23 (.03)	1.32 (.05)	1.06 (.04)
<i>gracilis</i>	M	5	1.18 (.03)	1.50 (.05)	1.12 (.03)	1.32 (.02)	1.05 (.02)	1.14 (.01)	1.27 (.01)	1.17 (.00)
<i>gracilis</i>	F	5	1.15 (.06)	1.49 (.06)	1.12 (.06)	1.29 (.08)	1.02 (.02)	1.17 (.07)	1.30 (.04)	1.14 (.06)
<i>latipes</i>	M	5	2.34 (.04)	2.98 (.09)	2.31 (.05)	2.78 (.09)	1.01 (.03)	1.07 (.03)	1.28 (.05)	1.21 (.02)
<i>latipes</i>	F	5	2.38 (.07)	3.14 (.06)	2.41 (.04)	2.94 (.06)	0.99 (.02)	1.07 (.04)	1.32 (.05)	1.22 (.04)
<i>opacus</i>	M	5	1.51 (.05)	1.59 (.09)	1.46 (.06)	1.49 (.04)	1.03 (.03)	1.07 (.04)	1.06 (.06)	1.02 (.05)
<i>opacus</i>	F	5	1.57 (.06)	1.63 (.17)	1.51 (.04)	1.61 (.15)	1.04 (.01)	1.01 (.03)	1.04 (.08)	1.07 (.08)
<i>parcus</i>	M	5	1.76 (.03)	2.20 (.05)	1.69 (.02)	1.96 (.08)	1.04 (.01)	1.12 (.04)	1.25 (.02)	1.16 (.04)
<i>parcus</i>	F	5	1.85 (.03)	2.27 (.03)	1.77 (.00)	2.13 (.04)	1.04 (.02)	1.07 (.01)	1.23 (.03)	1.20 (.02)

PL = Pronotal length; EL = elytral length (measured from epipleuron to base); PW = pronotal width; EW = elytral width. Mean and standard deviation (in parentheses) are given for each measurement.

that more closely resembles the genus *Lathrobium* ("apparently mimetic . . . of *Lathrobium* . . .," Sharp, 1886, p. 628). The characters distinguishing these genera appear to be significant based on the degree of difference between other genera of Paederinae. However, generic distinction begins to falter when examining the North American species. Both *picipes* Er. and *obsidianus* Casey have edentate mandibles as found in *Araeocerus*, but they clearly have the habitus of *Lathropinus*. Indeed, *picipes* has at different times been placed in both genera (Sharp, 1886; Casey, 1910; Bernhauer & Schubert, 1912; Moore & Legner, 1975).

On examination of *Araeocerus niger* (type species of *Araeocerus*) it appears that edentate mandibles may not be a significant generic character in the Pinophilina. *Araeocerus niger* has very complex and highly modified male genitalia as found in *Pinophilus*. *Pinophilus picipes* and *obsidianus* have the primitive type of genitalia as found in *Lathropinus*. Edentate mandibles, therefore, have probably evolved independently at least twice.

Morphology

BODY SIZE AND FORM—All of the North American Pinophilina are comparatively large in size. Species range from a maximum length of 19.5 mm, *Pinophilus latipes*, to a minimum of 7.5 mm, *P. gracilis*. Although overall body size varies considerably for individual species, differences between some species are significant and size is useful as a diagnostic character. Among the North American *Pinophilus*, the largest species is *P. latipes*; *P. parcus* and *P. densus* are nearly equal in size and slightly smaller than *P. latipes*; *P. opacus* is smaller than *P. densus* or *P. parcus*; and *P. gracilis* is the smallest. The measurements of pronotal length (PL) or pronotal width (PW) as shown in Table 1 are clear indicators of body size differences. In body form the species of *Pinophilus* are very consistent. The only exception is the size of the elytra: *P. opacus* has reduced elytral length (EL) and elytral width (EW), and compared to all other North American species, has significantly smaller EL:PL

and EW:PW ratios (see table 1). The reduced elytra are similar in appearance to those found in some flightless Paederinae, but all specimens of *P. opacus* examined have fully developed hind wings.

Surface Sculpturing

The unusual variety of surface sculpturing in *Pinophilus* is one of the most distinctive features of the genus. All of the species have large umbilicate punctures, as do most species of the subfamily Paederinae. In some species of *Pinophilus* the shallow impressions surrounding the umbilicate punctures are markedly sculptured (figs. 20, 22, 46). Sculptured umbilicate punctures occur only on the dorsal surface of the head and pronotum.

The degree of sculpturing varies widely from species to species. The most extreme condition occurs in the Neotropical species *Pinophilus sulcatus* Sharp. Among the North American *Pinophilus* all except *P. gracilis* Fall have at least some umbilicate punctures with distinct sculpturing. The sculpturing is most pronounced toward the basal and lateral margins of the head. The presence of such punctures is undoubtedly a derived character at some level within *Pinophilus*. As currently defined, not all species of *Pinophilus* have sculptured umbilicate punctures.

Additional taxonomic characters involving microsculpture include relative size and abundance of micropunctures on surfaces between umbilicate punctures. Micropuncture variation occurs principally on the dorsal surfaces of the head and pronotum, and ranges from numerous minute punctures in *Pinophilus parvus* (fig. 46) to sparsely micropunctate in most species of *Pinophilus*. *Pinophilus latipes* is unique among the North American Pinophilina in having numerous medium-sized as well as minute micropunctures of the dorsum of the head (fig. 20).

Distribution and relative abundance of umbilicate punctures is also significant taxonomically. Variation occurs primarily on the dorsal surface of the pronotum. All of the North American *Pinophilus* have numerous umbilicate punctures on the pronotum, and the midlongitudinal impunctate space is very narrow or absent. The punctures bordering the impunctate space may form a distinct longitudinal series in some species. Umbilicate punctures on the elytra also vary slightly among pinophiline genera. In *Pinophilus*, the setae associated with the umbilicate punctures arise from the anterior edge of the impression (fig. 21).

The dorsal surfaces of the head, pronotum, and elytra have additional, distinctive microstructures. Members of *Pinophilus* and *Lathropinus* have minute, stout setae on all three areas. Species with very distinctively sculptured umbilicate punctures also have microsculpture surrounding some of the microsetae. This is true particularly of *P. latipes* (figs. 20, 22). Most of the setae, large and minute, have associated with them one or more minute porose plates (figs. 22–24). These porose plates do not appear to be correlated with the presence of sculptured umbilicate punctures.

Life History and Habitats

Very little is known about the life history and habitats of the Pinophilina. The great majority of specimens available in existing collections were collected at light or from light traps. A few specimens have been collected in damp leaf litter, but there does not appear to be any particular microhabitat preference. A few larval specimens have also been collected in leaf litter, suggesting that pinophilines may be true litter dwellers. If true, then the species would appear to be generally distributed in the litter habitat, occurring in very low density populations.

Only a single description of a pinophiline immature stage is available in the literature (Paulian, 1941). His specimen was only tentatively identified as a Pinophilina (genus undetermined) by process of elimination.

Genus *Pinophilus* Gravenhorst

Pinophilus Gravenhorst, 1802, p. 201; Laporte, 1835, p. 121; Nordmann, 1837, p. 154; Erichson, 1839–1840, p. 669; Kraatz, 1858, p. 667; Lacordaire, 1854, p. 102; Redtenbacher, 1874, p. 236; Lynch, 1884, p. 305; Sharp, 1886, p. 620; Casey, 1910, p. 193; Cameron, 1920 (1921), pp. 348, 352; Eichelbaum, 1908, p. 85; Gridelli, 1927, p. 114?; Cameron, 1931, pp. 2–4; Bernhauer, 1937, p. 586; Blackwelder, 1943, p. 376.

Type species: *Pinophilus latipes* Gravenhorst.

DIAGNOSIS—Among North American pinophiline genera, the genus *Pinophilus* is distinguished by the combination of the pronotum with numerous umbilicate punctures (figs. 20, 22); the male genitalia with flagellar orifice located dorsally (figs. 15–16); the dorsal plate of the male genitalia mod-

ified to form a very elongate, slender process which fits into a grooved 9th abdominal sternum (figs. 17–18); and by the 8th abdominal sternum of the male truncate or strongly produced posteriorly, but not notched, with the exception of *P. diffidens*.

Checklist of North American
Species of *Pinophilus*

- densus* LeConte
- aridus* Casey, NEW SYNONYM
- arizonicus* Casey, NEW SYNONYM
- pimalis* Casey, NEW SYNONYM

- diffidens* Casey
- gracilis* Fall
- latipes* Gravenhorst
- obesus* Casey, NEW SYNONYM
- opacus* LeConte
- confusus* Fall, NEW SYNONYM
- parvipennis* Casey, NEW SYNONYM
- parcus* LeConte
- texanus* Casey, NEW SYNONYM
- trajectus* Casey, NEW SYNONYM

Key to *Pinophilus* Species of America North of Mexico

- 1. Pronotum densely micropunctate, appearing dull (fig. 20) 2
- 1'. Pronotum with numerous umbilicate punctures, but very sparsely micropunctate, strongly shining 3
- 2(1). Head dorsum with numerous medium-sized micropunctures as well as small micropunctures (figs. 20, 22); body size large, length 14.0–19.5 mm; pronotal length 2.34–2.38 mm (table 1); male 8th sternum truncate; male 9th sternum with constricted apical portion wide, apex blunt; aedeagus as in Figures 15–16 **P. latipes** Gravenhorst
- 2'. Head with very few medium-sized and numerous small micropunctures (fig. 46); size smaller, length 10–14.5 mm; pronotal length 1.76–1.85 mm (table 1); male 8th sternum with constricting portion of apex very slender, apex pointed and hooked upward; aedeagus as in Figures 42–43 ... **P. parcus** LeConte
- 3(1'). Male 8th sternum with shallow V-shaped notch; male 9th sternum tridentate (figs. 8–9); aedeagus as in Figures 6–7 **P. diffidens** Casey
- 3'. Male 9th sternum not tridentate; aedeagus not as in Figures 6–7 4
- 4(3'). Male 9th sternum broad, abruptly and strongly constricted apically, apex slender, pointed, strongly upcurved (figs. 3–4); aedeagus as in Figures 1–2 **P. densus** LeConte
- 4'. Male 9th sternum slender, slightly constricted apically, apex slightly hooked but not distinctly upcurved (figs. 13–14); aedeagus not as in Figures 1–2 5
- 5(4'). Elytra entirely black; elytra short, subequal, or only slightly longer than pronotum (table 1); aedeagus as in Figures 37–38 **P. opacus** LeConte
- 5'. Elytra with narrow, posterior border light yellowish brown; elytra longer, 1.25 times or greater than length of pronotum (table 1); aedeagus as in Figures 11–12 **P. gracilis** Fall

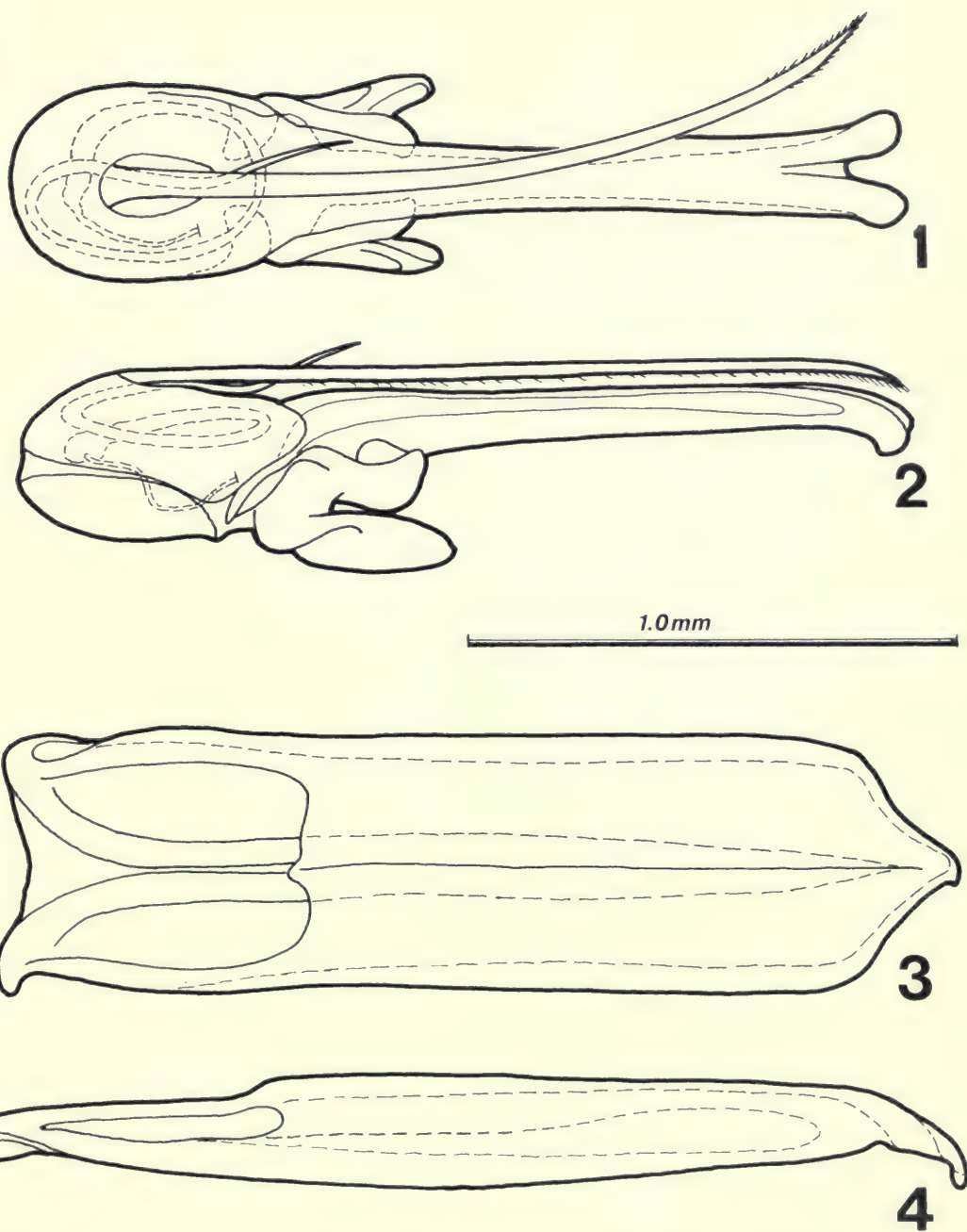
Pinophilus densus LeConte

- Pinophilus densus* LeConte, 1863, p. 48; Casey, 1910, p. 195; Arnett, 1968, p. 243.
- Pinophilus aridus* Casey, 1910, p. 196, NEW SYNONYM.
- Pinophilus arizonicus* Casey, 1910, p. 195, NEW SYNONYM.
- Pinophilus pimalis trajectus* Casey, 1910, p. 195, NEW SYNONYM.

DIAGNOSIS—*Pinophilus densus* may be distinguished from other species of *Pinophilus* by the

combination of the southwestern United States distribution, the reddish anterior half of the head, the abruptly constricted and strongly upcurved apex of the male 9th abdominal sternum (figs. 3–4), the strongly produced and apically truncate posterior margin of the male 8th abdominal sternum, and by the form of the male aedeagus (figs. 1–2).

DESCRIPTION—Body dark reddish brown, anterior half of head, labrum, and apex of abdomen light reddish brown; antennae, maxillae, and legs



FIGS. 1-4. *Pinophilus densus* LeConte, aedeagus. 1, median lobe, dorsal aspect; 2, median lobe, lateral aspect; 3, abdominal sternum IX, ventral aspect; 4, abdominal sternum IX, lateral aspect.

yellowish brown. Length 10-12 mm; pronotal and elytral measurements given in Table 1.

Head with relatively few large umbilicate punctures; impressions of umbilicate punctures micro-reticulate, especially those toward base of head; surface between umbilicate punctures smooth and

shining; intermediate-sized micropunctures absent; small micropunctures few in number and widely spaced. Antennae, mouthparts, and other features of the head as described for *Pinophilus latipes*.

Pronotum with numerous umbilicate punc-

tures, impressions of umbilicate punctures microreticulate; surface between umbilicate punctures smooth and shiny, without microsculpture; mid-longitudinal impunctate space narrow. Other features of prothorax as described for *Pinophilus latipes*. Legs, elytra, and mesosternum as described for *P. latipes*.

Abdominal segments 3–7 as described for *P. latipes*.

Female—Abdominal sternum 8 with posterior margin strongly produced and rounded; sternum 9 with notch at apex deep and rounded (sterna 8 and 9 similar to *P. parvus*); other features of female genitalia as described for *P. latipes*.

Male—Abdominal sternum 8 with posterior margin very strongly produced, apex truncate; surface of sternum anterior to posterior margin without setae; sternum 9 (figs. 3–4) broad and parallel sided, apex abruptly constricted and narrowed to upcurved point. Aedeagus (figs. 1–2) with median lobe elongate, gradually broadened to apex, apex bifid; dorsal surface of median lobe grooved at apex; parameres very reduced, with ventral flange well developed; flagellar foramen located at base; dorsal process present; flagellum strongly coiled; terminal portion of aedeagus not constricted.

RELATIONSHIPS—Among the North American species *Pinophilus densus* is most closely related to *P. parvus*. Probable shared derived characters include the strongly produced and truncate posterior margin of the male 8th sternum, and the very reduced parameres of the aedeagus (figs. 1–2, 42–43).

TYPE SPECIMENS—The type series of *Pinophilus densus* LeConte (2 males, 1 female) is located in the LeConte collection at the Museum of Comparative Zoology, Cambridge, Massachusetts. Each cotype bears an identical silver dot label, indicating an Arizona distribution (LeConte gives Colorado and Gila valleys as type locality). One male, with genitalia dissected, is herein designated as lectotype. The lectotype is missing its right antenna, but is otherwise in excellent condition.

The Casey collection at the United States National Museum contains two specimens (both female) labeled as *Pinophilus aridus* Casey. Since Casey did not state that the original description was based on a unique specimen and also did not designate a holotype, one of the specimens is herein designated as the lectotype. It bears the following labels “Ariz., Tucson; Casey bequest 1925; Type USNM 38376.” Casey gave Arizona, near Tucson, as the type locality. *Pinophilus aridus* Casey was distinguished from *P. densus* by the convexity of

the eyes, and from *P. arizonicus* by a more elongate body form. The characters given by Casey are not sufficient to distinguish species, and are well within the variation expected of *P. densus*.

The holotype, male, of *Pinophilus arizonicus* Casey is located in the Casey collection at the United States National Museum, Washington, D.C. The locality on the specimen indicates only “Ariz.,” but in the original description, Casey states that the type locality is probably southern Arizona. The holotype is missing both antennae beyond segment 2 and the middle left tarsus; otherwise, it is in perfect condition. The aedeagus of the holotype was not dissected. Casey distinguished *P. arizonicus* from *P. densus* by the convexity of the eyes, the body size, and by very subtle characters involving body sculpturing. None of these differ significantly from the variation found within *P. densus*. Abdominal sterna 8 and 9 are identical to those of *P. densus*.

Pinophilus pimalis Casey was described as a subspecies of *P. trajectus*. The latter is a synonym of *P. parvus*; however, *P. pimalis* differs from it significantly. It has the head reddish anteriorly and blackened only toward the base, and a distinct midlongitudinal impunctate space. These characters clearly separate it from *P. trajectus*. In all other respects it matches *P. densus* perfectly. The holotype, female, of *P. pimalis* is located in the Casey collection, United States National Museum.

DISTRIBUTION—*Pinophilus densus* occurs in the southwestern states, Florida, Iowa, Kansas, Mississippi, and almost certainly in northern Mexico. The southern limits of its distribution have not been established (fig. 5).

SPECIMENS EXAMINED—We have examined 120 specimens from the following localities: **UNITED STATES:** **Arizona:** no locality (2 males, 1 female, USNM); Chas. Palm (1 female, AMNH); Liebeck (2 females, MCZ); Pena Blanca (1 male, FMNH); Salt River, Liebeck (1 female, MCZ); **Pima Co.:** Arivaca, 30 January 1970, K. Stephan (1 male, FMNH); 25 January 1970, K. Stephan (1 male, FMNH); 27 July 1972, K. Stephan (1 female, FMNH); Tucson, November 1952, Bradt (1 male, CASC); 7 March 1936, Bryant (1 male, MCZ); Wickman (1 female, USNM); 21 July 1970, K. Stephan (1 female, FMNH); **Pinal Co.:** at blacklight trap, 19 November 1968, P. Bartholomew (1 female, CASC); Aravaipa Canyon, 8 February 1970, K. Stephan (1 male, FMNH); Phoenix, 10 December 1919, E. Schiffel (15 males, 6 females, CASC); 1920, E. Schiffel (1 female, CASC); 6 June 1970, K. Stephan (1 male, FMNH); Liebeck (2 males, 2 females, MCZ); Roland Haywood (1 male, 2 females, MCZ); **Santa Cruz Co.:** Nogales, Santa Cruz, 5 April 1975, K. Stephan (1 male, FMNH); (1 female, USNM); **Yuma Co.:** Yuma, July, W. H. Mann (1 male, CASC); S. Luis, 2 August 1940, Van Dyke (4 males, 3 females, CASC); 30 June, Ian Moore & Van Dyke (1

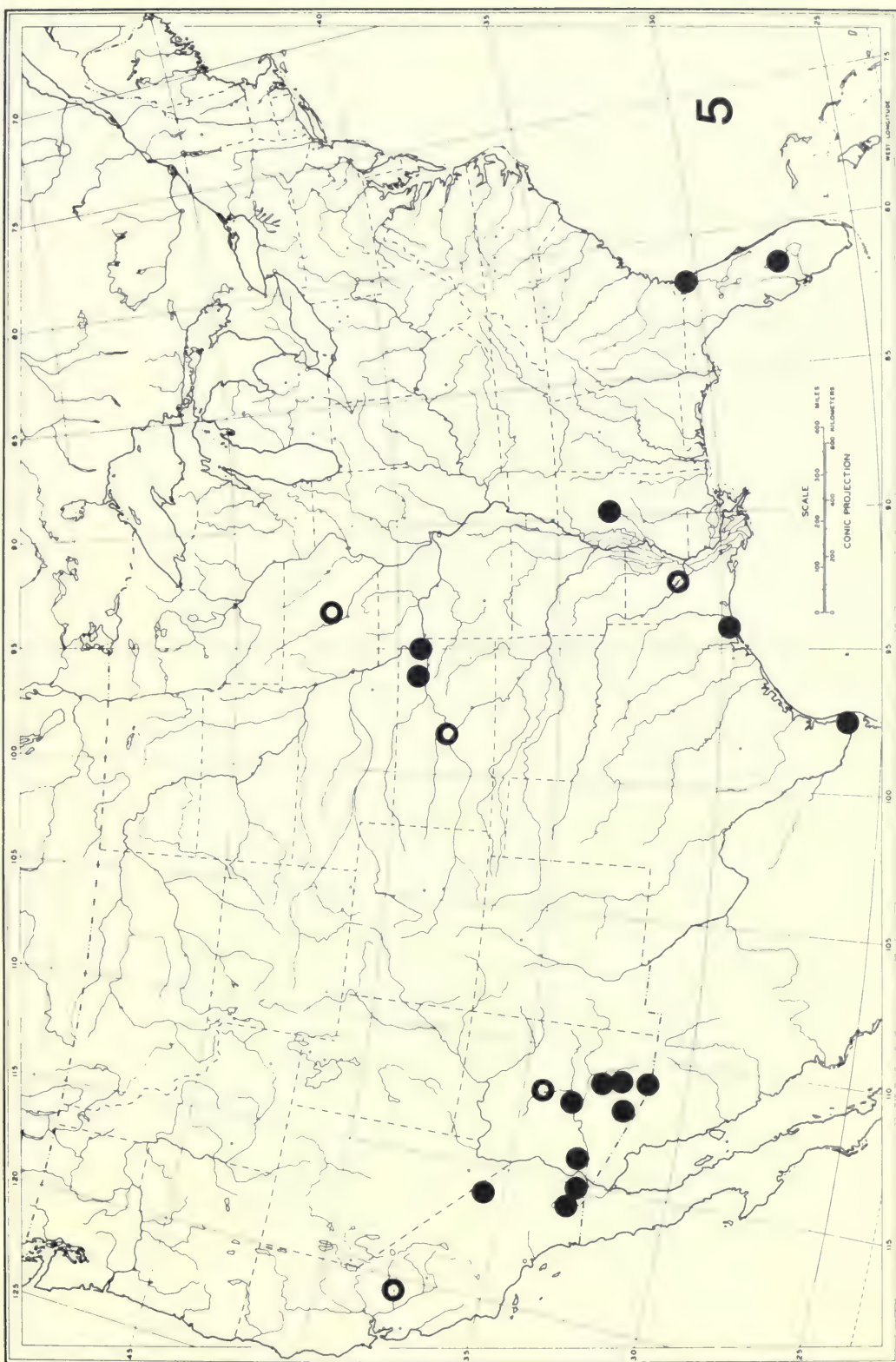


FIG. 5. *Pinophilus densus* LeConte, known distribution (O = state label only).

female, CASC); May, A. Fenyes (1 female, CASC); 18 March 1912, J. R. Slevin (1 male, CASC); 30 June, Van Dyke (1 female, CASC); San Luis, 2 August 1940, Van Dyke (2 males, CNC); 6 mi N of San Luis, 11 August 1940, B. E. White (2 females, FMNH); 4 April 1923, A. Fenyes (2 males, 2 females, CASC); Yuma, Gila River, 600 ft elevation, 28 June 1927, H. Notman (1 male, CNC). **California:** no locality, 4 November 1926, Blaisdell (1 male CASC); April, A. Fenyes (1 female, CASC); A. Agazzi (1 male, MCZ); Ft. Yuma, 21 August 1924, E. P. Vanduzee (1 male, CASC); *Imperial Co.*: 4 August 1925 (1 female, CNC); Potholes, 12 April 1923, E. P. Vanduzee (2 males, 6 females, CASC); 27 August (1 male, CASC); Potholes, 4 August 1923, E. P. Vanduzee (1 female, CASC); Potholes, 4 November 1925, Blaisdell (1 female, CASC); El Centro, 26 January 1918, Blaisdell (1 female, CASC); El Centro, 26 January 1910, Blaisdell (1 female, CASC); Imperial Dam, black light, 22 July 1965, L. Berman (6 males, AMNH); 30 May 1925, G. H. Field (1 male, MCZ); G. H. Field (1 male, 1 female, MCZ); Westmoreland, blacklight trap, 24 June 1959, Harrison (1 male, CNC); *Inyo Co.*: 25 June (1 female, CNC); *Riverside Co.*: Coachella, 24 November 1931, A. Williamson (1 female, CASC); 22 May 1928, Van Dyke (1 male, CASC); *San Diego Co.*: 1966, A. Bierig (1 male, FMNH). **Florida:** *Duval Co.*: Jacksonville, 28 July 1942, R. O. Barnes & Stehr (1 male, CNC); *Highlands Co.*: Lake Placid, Archbold Biological Station, 30 March 1962, D. C. Ferguson (1 male, USNM). **Iowa:** no locality, 24 May 1925, H. H. Keifer (1 male, CASC). **Kansas:** no locality (1 male, 1 female, AMNH); *Leavenworth Co.*: Leavenworth, 4 June 1984, H. Solton (1 female, USNM); *Potawatomee Co.*: Manhattan, 15 March 1930 (1 female, AMNH). **Louisiana:** no locality (4 males, 3 females, AMNH). **Mississippi:** *Carroll Co.*: Hwy. 82, 8 mi E, 21 July 1971, D. Brzoska (1 female, AMNH). **Texas:** *Cameron Co.*: Brownsville, November 1942, E. S. Ross (1 male, CASC); Cameron, 9 May 1908 (1 male, CNC); *Jefferson Co.*: Port Arthur, 31 May 1948, M. Cazier (1 male, AMNH).

***Pinophilus diffidens* Casey**

Pinophilus diffidens Casey, 1910, p. 196.

DIAGNOSIS—*Pinophilus diffidens* may be distinguished from other North American species of *Pinophilus* by the head dorsum with large umbilicate and scattered micropunctures while lacking intermediate-sized punctures, the relatively high EL:EW ratio (table 1), the male 9th abdominal sternum broad with apex tridentate, and aedeagus with apex triangulate and rounded.

DESCRIPTION—Body reddish brown throughout; anterior margin of head, labrum, mandibles, and apex of abdomen reddish brown; antennae, maxillary palps, and legs yellowish brown. Length 9.5–10.5 mm; pronotal and elytral measurements given in Table 1.

Head dorsum with large umbilicate and scattered micropunctures, lacking intermediate-sized punctures as in *Pinophilus latipes*. Impressions of

dorsal umbilicate punctures lacking microsculpture. Antennae, mouthparts, and other features of the head as described for *P. latipes*.

Pronotum densely punctate with numerous umbilicate punctures; surface between punctures without microsculpture; impressions of punctures without microsculpture. Remainder of prothorax as described for *P. latipes*. Legs, elytra, mesosternum, and abdominal segments 3–7 as described for *P. latipes*.

Female—Abdominal sternum 8 with posterior margin strongly produced, apex rounded; sternum 9 with notch at apex, apex rounded.

Male—Abdominal sternum 8 with posterior margin strongly produced, apex with shallow V-shaped notch. Abdominal sternum 9 broad with apex tridentate (figs. 8–9). Aedeagus with median lobe elongate, abruptly broadened to apex, apex triangulate and rounded; parameres very reduced (figs. 6–7).

RELATIONSHIPS—*Pinophilus diffidens* is a generalized North American *Pinophilus* species. While sharing features with the *gracilis-opacus* species pair, such as the position of the flagellar opening (figs. 6–7, 11–12), *P. diffidens* additionally shares features of the *densus-parvus* species pair, including the aedeagus with median lobe elongate and the very reduced parameres with ventral flange well developed (figs. 6–7, 37–38).

TYPE SPECIMENS—The type series of *Pinophilus diffidens* were examined from the Casey collection from the United States National Museum. The type series consists of 12 specimens (8 males, 4 females), of which one male bearing the label “Tex, Casey bequest 1925, Type 38379, diffidens Csy.” is herein designated as lectotype. The genitalia of the lectotype specimen were dissected and stored in glycerine. Type locality for *P. diffidens* is “Tex.” Additional label data for the type series is “Tex.”

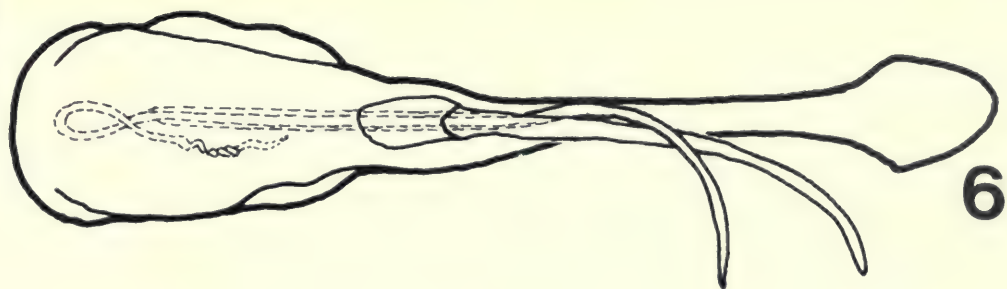
DISTRIBUTION—From the limited number of specimens and data available, *Pinophilus diffidens* is currently known only from Texas (fig. 10).

SPECIMENS EXAMINED—We have examined 12 specimens with the following data: **UNITED STATES: Texas:** no locality (lectotype, 1 male; paratypes, 7 males, 4 females, USNM).

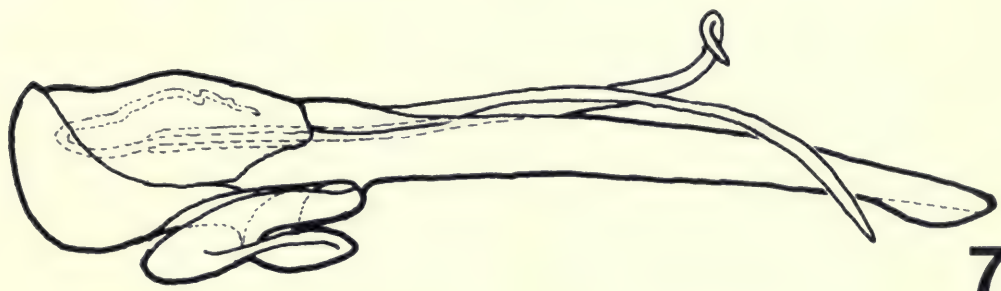
***Pinophilus gracilis* Fall**

Pinophilus gracilis Fall, 1932, p. 57.

DIAGNOSIS—*Pinophilus gracilis* may be distinguished from other species of *Pinophilus* by the

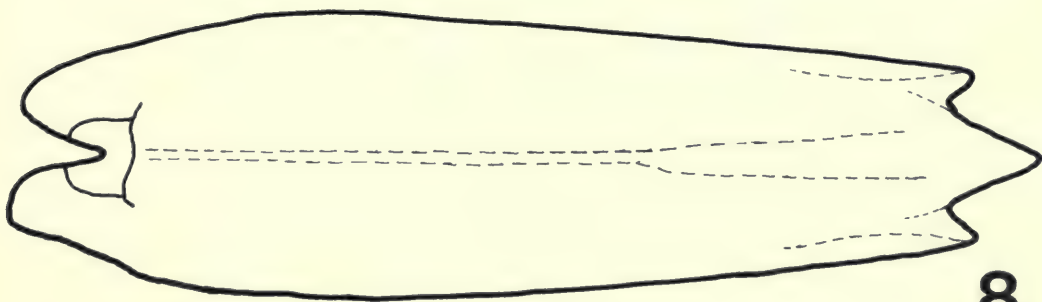


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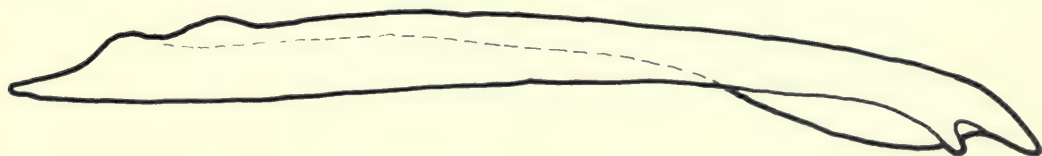


7

1.0 mm



8



9

FIGS. 6-9. *Pinophilus diffidens* Casey, aedeagus. 6, median lobe, dorsal aspect; 7, median lobe, lateral aspect; 8, abdominal sternum IX, ventral aspect; 9, abdominal sternum IX, lateral aspect.

combination of the small body size (length 7.5–9.5 mm, see also table 1), the elytra color black with a very narrow posterior border pale, the 9th abdominal sternum of the male evenly narrowed to apex, not abruptly constricted, the flagellum of the aedeagus not coiled, and by the flagellar opening of the aedeagus located on the middorsal surface of the median lobe.

DESCRIPTION—Body dark reddish to black; anterior margin of head, labrum, mandibles, posterior margin of elytra, and apex of abdomen reddish brown; antennae, maxillary palps, and legs light yellowish brown. Length 7.5–9.5 mm; measurements of pronotum and elytra given in Table 1.

Head dorsum with relatively few umbilicate punctures, impressions of dorsal and lateral punctures without microsculpture; surface between punctures smooth and shiny, very sparsely and finely micropunctate. Antennae noticeably shorter than *Pinophilus latipes*, segments 7–10 each shorter than twice their width. Mouthparts and other features of the head as described for *P. latipes*.

Pronotum with numerous umbilicate punctures; midlongitudinal impunctate area very narrow; impressions of punctures lacking microsculpture; surface between punctures smooth and shining, not micropunctate. Other features of prothorax as described for *Pinophilus latipes*. Legs, elytra, and mesosternum as described for *P. latipes*.

Abdominal segments 3–7 as described for *P. latipes*.

Female—Abdominal sternum 8 with posterior margin moderately produced, less produced than *Pinophilus densus*; 9th sternum with deep V-shaped notch at apex; 9th tergum with apical notch broadly rounded.

Male—Abdominal sternum 8 with posterior margin strongly produced, apex truncate; 9th sternum broad basally, gradually tapered toward apex, with small, dorsal projecting hook; ventral surface with short, longitudinal carina near middle (figs. 13–14). Aedeagus with median lobe short, broad, apex triangular; dorsum of median lobe not grooved apically; parameres short and stout, but not greatly reduced, medial tooth present; ventral flange of paramere absent; flagellar orifice located on ventral surface of median lobe; flagellum straight, not greatly coiled within base of aedeagus; dorsal process absent; basal portion of aedeagus strongly constricted (figs. 11–12).

RELATIONSHIPS—Among the North American species, the nearest relative of *Pinophilus gracilis* appears to be *P. opacus* LeConte. This proposed

relationship is based on the short and uncoiled flagellum of the male genitalia and on the position of the flagellar opening (figs. 11–12, 37–38). These are also the only two among the North American species that have the 9th sternum of the males gradually narrowed and very slightly constricted at the apex (figs. 13–14, 39–40).

TYPE SPECIMENS—The holotype and two paratypes of *Pinophilus gracilis* were examined from the Fall collection at the Museum of Comparative Zoology, Cambridge, Massachusetts. The male genitalia of the holotype were dissected and stored in a glycerine vial with the specimen. The type locality for *P. gracilis* is Tallulah, Louisiana; additional label data for the type series was given in the original description (Fall, 1932).

DISTRIBUTION—Records indicate *Pinophilus gracilis* predominates states bordering the north and west coasts of the Gulf of Mexico; however, a single specimen has been recorded from Kansas. No specimens have been found yet from Florida (fig. 10).

SPECIMENS EXAMINED—We have examined 43 specimens from the following localities: **UNITED STATES: Kansas:** Douglas Co.: April, E. S. Tucker (1 male, AMNH). **Louisiana:** Madison Pa.: Tallulah, 2 July 1930, H. B. Mills (paratypes: 1 male, 1 female, MCZ); 23 July 1930, P. A. Glick (holotype: 1 male, MCZ); Vermilion Pa.: Gueydan, at light, 25–26 June 1925, E. Kalmbach (1 male, 1 female, USNM). **Texas:** Anderson Co.: Salmon, 7 June 1975, black light, J. S. Ashe (1 female, FMNH); Cameron Co.: Brownsville, 11–16 June 1933, Darlington (1 female, MCZ); at light, October 1942, E. S. Ross (2 males, CASC); Comanche Co.: Proctor and nearby farms, 24 June 1970, J. W. Smith & A. R. Hardy (7 males, 2 females, AMNH); Nueces Co.: Lake Corpus Christi, 9 mi S Swinney Switch, 22 July 1974 (13 males, 9 females, FMNH); San Patricio Co.: Sinton, Welder Wildlife Foundation, 3 May 1967, A. & M. E. Blanchard (2 females, USNM).

Pinophilus latipes Gravenhorst

Pinophilus latipes Gravenhorst, 1802, p. 201; Say, 1834, p. 456; Erichson, 1840, p. 674; Lacordaire, 1854 (illustrated plate 15, fig. 7); Blatchley, 1910, p. 440; Casey, 1910, p. 194.

Pinophilus obesus Casey, 1910, p. 194, NEW SYNONYM.

DIAGNOSIS—*Pinophilus latipes* may be distinguished from other species of *Pinophilus* by the combination of the pronotum with numerous micropunctures between larger umbilicate punctures, the head with numerous intermediate as well as small-sized micropunctures; the males with the apex of the 9th abdominal sternum abruptly con-

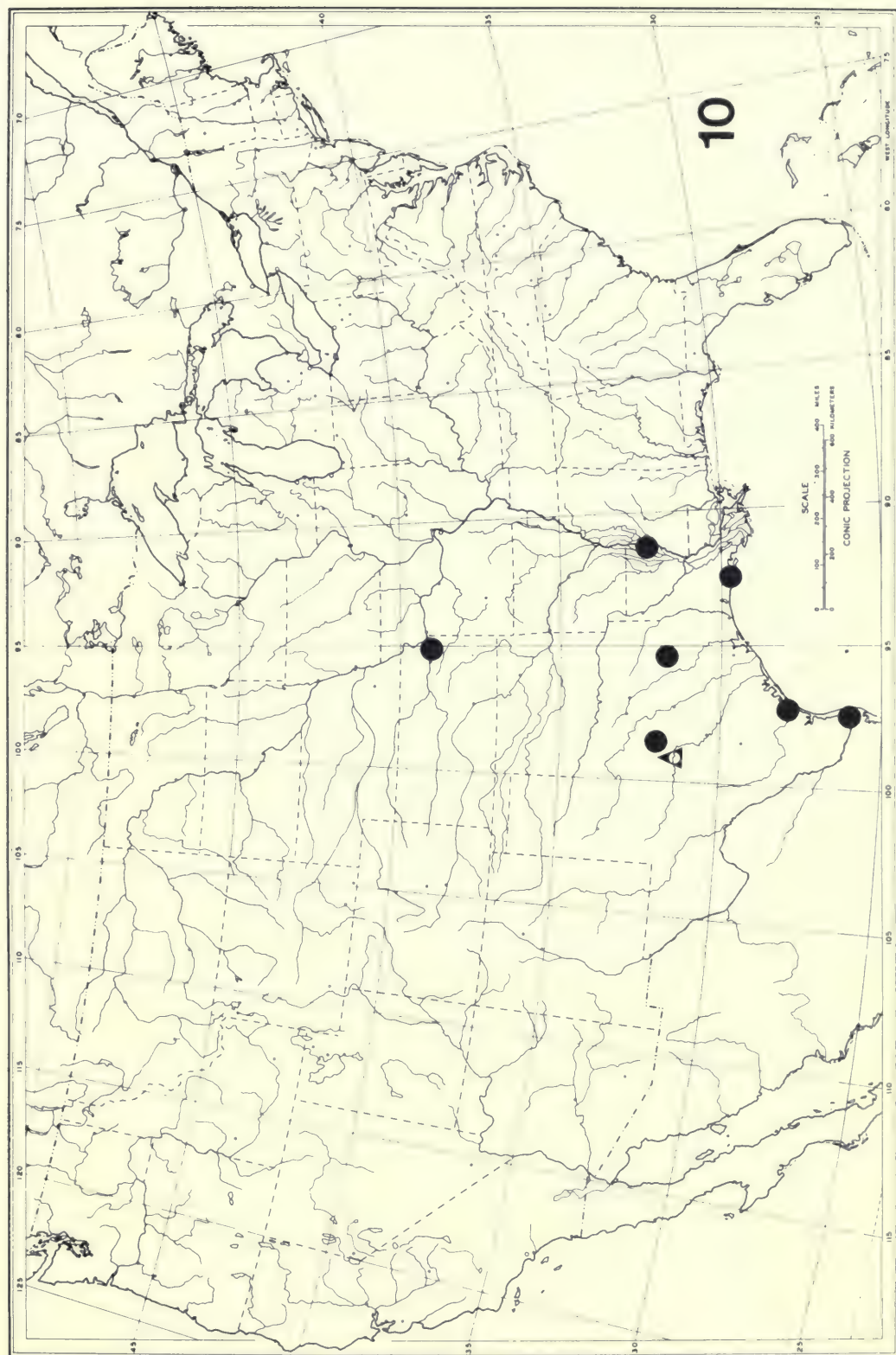
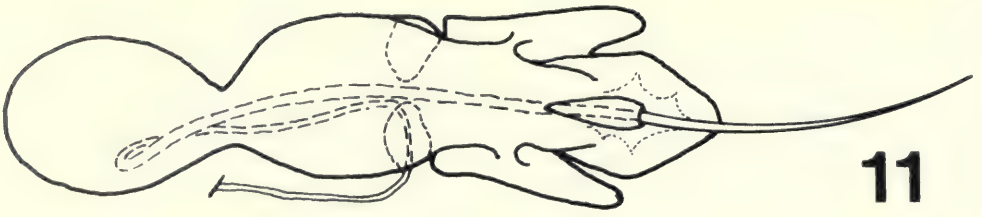
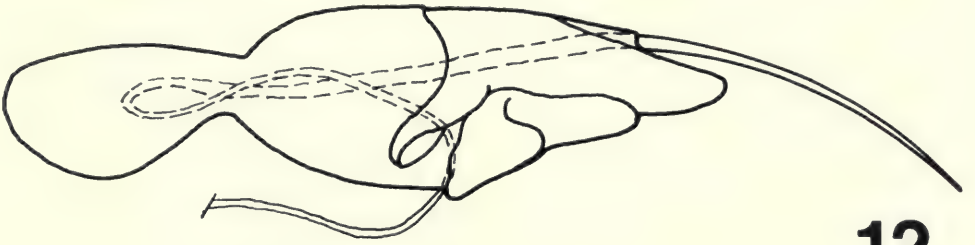


FIG. 10. *Pinophilus diffidens* Casey and *P. gracilis* Fall, known distribution (Δ = *P. diffidens*, state label only, $\bullet$ = *P. gracilis*).

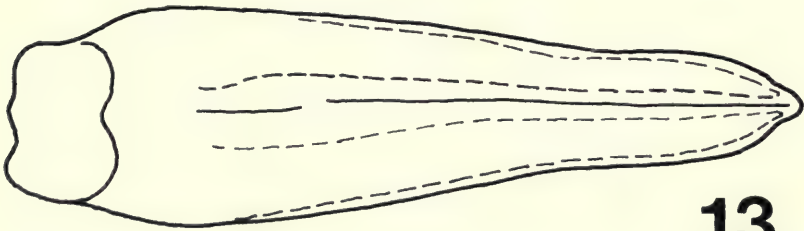


11

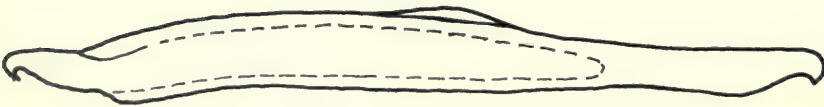


12

1.0 mm

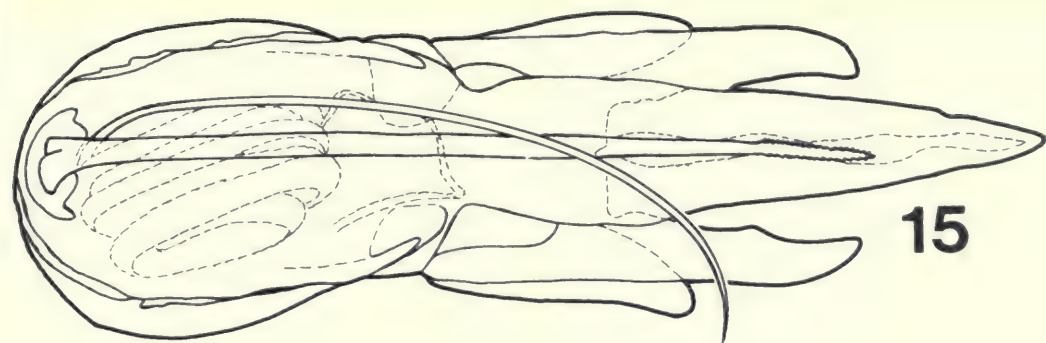


13

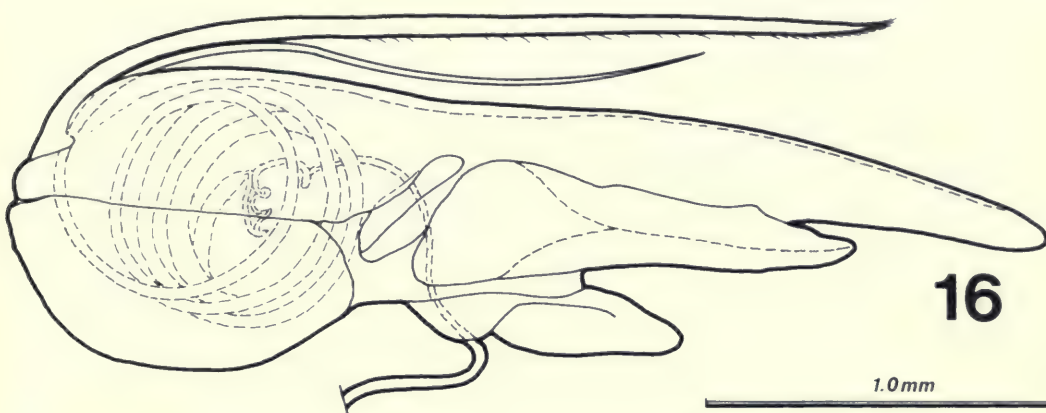


14

FIGS. 11-14. *Pinophilus gracilis* Fall, aedeagus. 11, median lobe, dorsal aspect; 12, median lobe, lateral aspect; 13, abdominal sternum IX, ventral aspect; 14, abdominal sternum IX, lateral aspect.

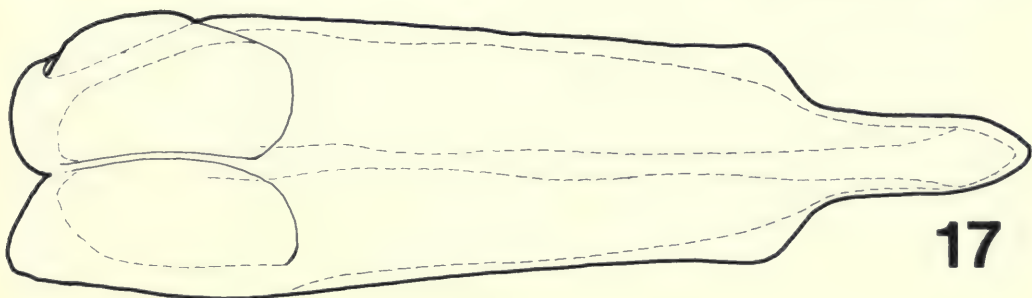


15

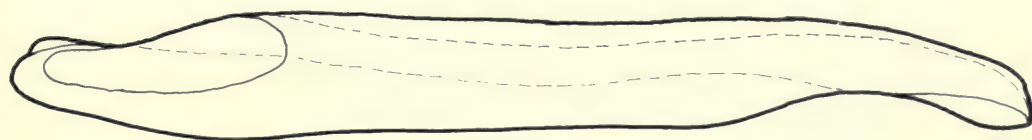


16

1.0mm



17



18

FIGS. 15-18. *Pinophilus latipes* Gravenhorst, aedeagus. 15, median lobe, dorsal aspect; 16, median lobe, lateral aspect; 17, abdominal sternum IX, ventral aspect; 18, abdominal sternum IX, lateral aspect.

stricted, the constricted portion of the 9th sternum rather broad, nearly straight in lateral view, and blunt at tip (figs. 17–18), and by the form of the aedeagus (figs. 15–16).

DESCRIPTION—Body black throughout; legs, maxillae, and antennae yellowish brown; labrum, mandibles, and apex of abdomen reddish brown. Body broad, elytra longer and broader than pronotum (see table 1). Length 14.0–19.5 mm; measurements of pronotum and elytra are given in Table 1.

Head dorsum with three types of punctures: large umbilicate, medium-sized punctures not associated with setae, and small micropunctures. Impressions of large umbilicate punctures microreticulate (see figs. 20, 22). Eyes large, without interfacetal setae. Antennae elongate and slender, segments about 3–4 times longer than wide. Labrum short and very wide; middle with broad, rounded notch; each side of notch with blunt, shallow tooth; dorsum with 7–8 large setae on surface and numerous (35 or more) small setae along anterior margin (figs. 25–26). Mandibles: right and left nearly identical in size and shape; each with large, bifid median tooth; apex acuminate; outer margin with 3 (sometimes 4) setae near base (fig. 19). Maxillae: cardo without setae; basistipes with 1 seta on each posterolateral corner and one seta along middle of inner margin; dististipes with 4 setae along outer margin; palpus with 4 segments, segment 1 very short, segments 2–4 elongate, subequal; palpal segment 1 with 3–4 minute setae, segments 2–3 densely pubescent; 4th segment asymmetrical, as long as and broader than 3rd (fig. 27). Labium: ligula broadly bilobed, membranous; adoral surface with blunt, lightly sclerotized tooth and with large, V-shaped patch of fine setae within the V-shaped hypopharangeal combs (fig. 28); prementum with 4 pair of setae between bases of labial palps; mentum with 2 large setae near anterolateral corners and patch of small setae at corners; palps 3 segmented, segment 1 with one large seta on medial margin (figs. 28–29), segment 2 with 3 large setae at apex of ventral surface and numerous medium to small setae on dorsal and lateral surfaces; segment 3 constricted before apex, with minute setae scattered about the surface. Submentum with 2 pair of setae along anterior margin. Gula without setae; gular sutures strongly convergent posteriorly to nuchal constriction and strongly divergent from constriction to base of head; sutures nearly contiguous at point of narrowest separation.

Pronotum densely punctuate with narrow me-

dian impunctate area along midline; umbilicate punctures and micropunctures as on head; lateral marginal ridge slightly curved in lateral view, widely separated from protergosternal sutures anteriorly.

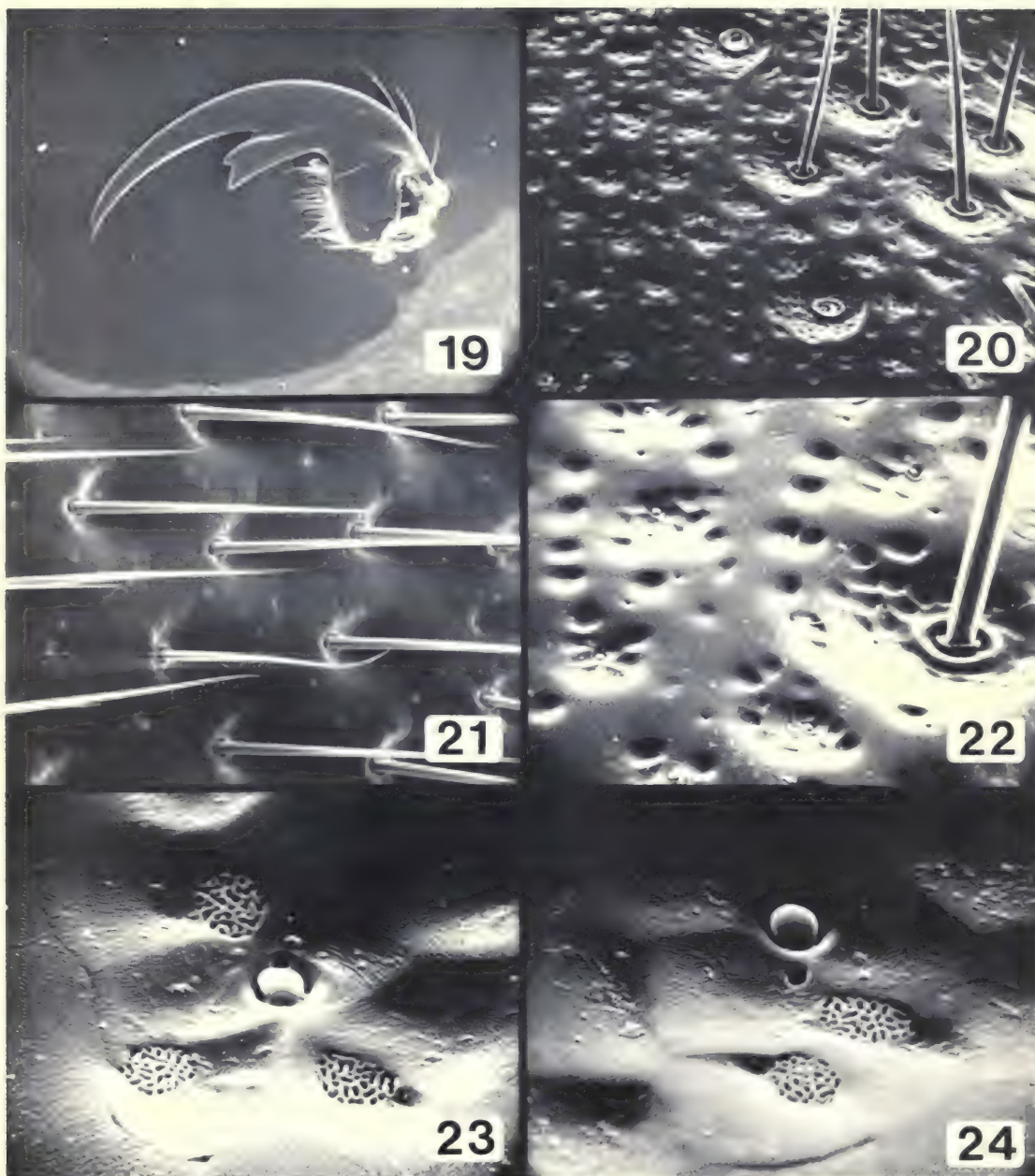
Prosternum very short, with large midlongitudinal carina; prosternal process short, continuous with lightly sclerotized plate extending beneath coxae and completely enclosing coxal cavities. Mesosternum as in Figure 30. Elytra densely punctate, punctures not forming distinct series; surface between punctures smooth and shining, without micropunctures, punctures not umbilicate as on head and pronotum, seta arising from anterior margin of puncture (fig. 21); epipleural ridge absent. Legs: anterior femur and tibia very robust; anterior tarsus greatly expanded in males and females, with large pads beneath (figs. 31–32); middle and hind tarsus slightly expanded, 5th segment arising from basodorsal surface of 4th; hind tibia with well-developed ctenidia on inner and outer margins of apex.

Abdomen: terga 3–7 with pair of oval cuticular structures (function unknown; see figs. 33–35) near anterior margin; spiracles of segments 3–8 located at anterolateral corners; 2 pair of lateral sclerites present on segments 3–6; segment 7 with one pair of lateral sclerites; sternum 1 with median carina and lateral pair of carina along anterior margin.

Female—Abdominal sternum 8 with posterior margin shallowly produced, surface with numerous small setae in central region; sternum 9 with apex deeply notched, not showing evidence of divided coxities or valvifers; tergum 9 with apex shallowly notched; tergum 10 absent.

Male—Abdominal sternum 7 with posterior margin broadly and shallowly concave; sternum 8 with posterior margin truncate, surface with broad aetose area in front of posterior margin. Sternum 9 broad at base, slightly narrowed toward apex, apex strongly constricted, blunt and shallowly up-curved (figs. 17–18). Aedeagus (figs. 15–16) with median lobe moderately long, evenly narrowed to pointed apex; dorsum of median lobe not grooved; parameres broad and short, but not greatly reduced, inner margin with blunt tooth; ventral flange of paramere well developed; flagellar foramen located basally; flagellum very long and coiled within base of aedeagus; dorsal process well developed; basal portion of aedeagus not constricted.

TYPE SPECIMENS—The type series of *Pinophilus latipes* is located in the Zoologisches Museum, Museum für Naturkunde der Humboldt-Universität, Berlin, East Germany. It consists of four



FIGS. 19–24. *Pinophilus latipes* Gravenhorst. 19, mandible, 60 $\times$; 20, dorsum of head, micropunctures, 300 $\times$; 21, elytra, position of setae in pores, 312 $\times$; 22, dorsum of head, micropunctures and porose plates; 23–24, detail of porose plates, 5,000 $\times$.

specimens: one male and two females bearing the labels “Pennsylvania, Nordm. Nr. 6479, Typus, Zool Mus. Berlin” and one male bearing the label “Latipes, gr. Pennsylv. Nord 6479, Typus, Zool. Mus. Berlin,” which is herein designated as lectotype. The genitalia of the lectotype were dis-

sected and stored in a glycerine vial with the specimen. The lectotype is missing the left antennae beyond segment 8, but is otherwise in excellent condition.

The type series of *Pinophilus obesus* Casey is located in the Casey collection at the United States



FIGS. 25–29. *Pinophilus latipes* Gravenhorst. 25, labrum, dorsal aspect, 68 $\times$; 26, labrum, detail of setal patterns, 144 $\times$; 27, maxilla, 120 $\times$; 28, labium, adoral aspect, 120 $\times$; 29, labial palpus, 250 $\times$.

National Museum. It consists of three males and four females, all bearing the following labels “Tex (with red dot indicating El Paso); Casey bequest 1925; type (or paratype) USNM 38374; *obesus* Csy.” One male is herein designated as lectotype. The genitalia of the lectotype were not dissected. The lectotype is missing the right antennae beyond seg-

ment 4, but is otherwise in perfect condition. Casey distinguished *P. obesus* from *P. latipes* based on head, pronotal, and elytral proportions and on subtle characters involving punctures of the pronotum and elytra. None of the characters mentioned by Casey depart significantly from the range of variation found within *P. latipes*.



FIGS. 30–32. *Pinophilus latipes* Gravenhorst. 30, mesosternum, ventral aspect, 45 $\times$; 31, anterior tarsus, dorsal aspect, 50 $\times$; 32, anterior tarsus, ventral aspect, 65 $\times$.



FIGS. 33–35. *Pinophilus latipes* Gravenhorst. 33, abdominal tergum III, left dorsal aspect, showing position of oval cuticular structures, 125 $\times$; 34, oval cuticular structures, detail, 620 $\times$; 35, oval cuticular structures, detail, 800 $\times$.

RELATIONSHIPS—*Pinophilus latipes* is probably the most generalized among the North American *Pinophilus* species. It shares several features with the *gracilis-opacus* species pair, but these are here interpreted as primitive. These include the long slender dorsal plate, the accessory flanges located below the parameres, and the basal location of the flagellar opening (figs. 11–18, 37–40).

DISTRIBUTION—*Pinophilus latipes* is one of the most abundant North American species of *Pinophilus*. It occurs in eastern North America from New Jersey, Pennsylvania, and Ohio south through Florida, and as far west as eastern Texas and Oklahoma (fig. 36).

SPECIMENS EXAMINED—We have examined 565 specimens from the following localities: **UNITED STATES:** **Alabama:** no locality (1 male, FMNH); *Autauga Co.*: Montgomery, 27 May 1952, W. Rosenberg (1 male, 1 female, USNM); 18 June 1951, W. Rosenberg (1 male, USNM); *Lee Co.*: Auburn, 14 March 1971, E. J. Kiteley (2 females, CNC); 5 March 1971, E. J. Kiteley (2 males, 2 females, CNC); *Jefferson Co.*: Birmingham, shades mountain, at light, 10 July 1979, T. King (1 female, FMNH); *Mobile Co.*: Mobile, 26 June 1927, J. C. Pallister (1 male, FMNH); 20–22 April 1957, H. & A. Howden (1 male, CNC); *Morgan Co.*: Decatur, 4 June 1950?, P. H. Thompson (1 male, USNM); *Tuscaloosa Co.*: 8 May 1949, B. D. Valentine (2 males, AMNH); at light, 2 May 1953, B. Valentine (1 male, 1 female, AMNH); *Walker Co.*: Jasper, 17 July 1979, light, T. King (1 female, FMNH). **Arkansas:** no locality (1 male, FMNH); *Fulton Co.*: UV light trap, C. L. Selman (1 female, FMNH); *Hempstead Co.*: H. C. Fall (1 male, 1 female, MCZ); 16 June 1926, John George Gehring (1 female, MCZ); 28 May 1933, R. Happing (1 male, CASC); Hope, 28 May 1933, R. Hopping Coll. (3 females, CASC). **Florida:** no county, Paradise Key, 4 June 1951, H. & A. Howden (1 male, USNM). *Alachua Co.*: Gainesville, 23 June 1959, R. E. Woodruff (1 female, MCZ); 29–31 March 1960, H. F. Howden (1 female, CNC); light trap, June–July 1955 (1 male, CNC); blacklight trap, 14 March 1963, R. E. Woodruff (1 female, FMNH); blacklight trap, 8–12 April 1968, R. E. Woodruff (5 males, 6 females, FSCA); 27–29 May 1968 (1 male, 1 female, FSCA); *Broward Co.*: Hollywood, 12 May 1967, D. E. Bright (1 female, CNC); *Collier Co.*: 8 mi SE Naples, UV light, 12 July 1972, M. Druckenbrod (1 female, USNM); Seminole State Park, 22 June 1965, C. W. O'Brien, blacklight trap (4 males, 2 females, CNC); *Dade Co.*: Everglades, Coopertown, 1 March 1968, A. Smetana (1 male, 1 female, CNC); Everglades National Park, Royal Palm Hammock, forest, UV, 30 July 1981, S. Peck (1 female, CNC); 18 mi NW Hialeah, Hwy. 27, blacklight trap, 20 June 1965, C. W. O'Brien (2 males, 1 female, CNC); *Duval Co.*: Jacksonville, 26 June 1956, P. H. Thompson (1 male, USNM); 2 July 1957, P. H. Thompson (1 female, USNM); *Gadsden Co.*: Quincy, at light, 8 June 1950, H. K. Townes (2 males, USNM); *Hardee Co.*: Torreya State Park, 1 May 1952, J. R. McGillis (3 males, 3 females, CNC); 29 June 1952, J. R. McGillis (1 female, CNC); *Hernando Co.*: Brooksville, at light, 20–21 June 1955, H. Dybas (1 male, 1 female, FMNH); *Highlands Co.*: Archbold Biological Station, 24 April 1967, D. E.

Bright (1 female, CNC); Archbold Biological Station, at light, 30 March 1975, J. H. Bengston (5 males, 2 females, FMNH); 28 February 1975, J. H. Bengston (3 males, FMNH); 23 September 1978, W. Rosenberg (2 males, USNM); 18 April 1976, W. Rosenberg (1 male, USNM); 28 April 1976, W. Rosenberg (1 male, USNM); 12 February 1975, J. H. Bengston (2 males, 2 females, FMNH); 20 April 1975, J. L. Bengston (2 males, FMNH); at light, 12–19 June 1955, H. S. Dybas (4 males, 5 females, FMNH); at light, 16 March 1975, J. L. Bengston (1 male, FMNH); at light, 17 March 1975, J. L. Bengston (1 male, FMNH); 20 April 1976, William Rosenberg (1 male, USNM); 17 April 1978, W. Rosenberg (1 male, AMNH); 23 April 1978, W. Rosenberg (1 male, 1 female, AMNH); 7 April 1975, Rosenberg (1 male, USNM); 8 April 1975, Rosenberg (1 male, 1 female, USNM); 29 April 1976, Rosenberg (3 males, USNM); 17 September 1978, Rosenberg (1 male, AMNH); 19 October 1978, Rosenberg (1 male, USNM); 4 November 1975 (1 male, AMNH); 6 April 1975, Rosenberg (4 males, 3 females, USNM); 28 April 1976, Rosenberg (2 males, AMNH); 27 April 1976, Rosenberg (1 male, USNM); 24 April 1976, Rosenberg (2 males, 3 females, USNM); 24 June 1979, Rosenberg (1 male, AMNH); 17 April 1976, Rosenberg (1 male, USNM); 29 November 1978, W. M. Rosenberg (1 male, USNM); 24 September 1978, W. M. Rosenberg (1 male, USNM); 15 February 1975, W. Rosenberg (1 male, USNM); hammock, blacklight trap, 24 June 1965, C. W. O'Brien (2 males, USNM); Hammock State Park, blacklight trap, 15 June 1965, L. & C. W. O'Brien (1 female, CNC); at light, 16 February 1975, J. H. Bengston (1 female, FMNH); 3 mi E Lake Placid, 14 August 1975, W. Suter (1 female, FMNH); 1 April 1947, J. W. Green (1 male, CASC); at light, 23 March 1975, J. L. Bengston (1 female, FMNH); 15 April 1975, Rosenberg (1 male, 3 females, USNM); 26 September 1978, W. Rosenberg (2 females, USNM); 29 September 1978, W. Rosenberg (1 male, 2 females, USNM); 4 April 1975, W. Rosenberg (1 male, 6 females, USNM); 2 April 1975, Rosenberg (1 female, USNM); 21 April 1976, Rosenberg (1 female, USNM); 15 April 1976, Rosenberg (1 female, USNM); 27 September 1978, W. M. Rosenberg (1 male, 1 female, USNM); 13 April 1975, W. Rosenberg (1 female, USNM); 24 March 1973, W. Rosenberg (1 female, USNM); S-29 2 mi N of TCT S-70, Parker Isl., 28 March 1967, M. Deyrup (1 female, AMNH); 29 May 1964, R. W. Hodges (1 female, USNM); Lake Placid, Archbold Biological Sta., 5 April 1975, Rosenberg (1 female, USNM); 12 June 1966 (1 male, MCZ); 12 June 1966, R. Silberglied (1 male, MCZ); UV black light (3 females, MCZ); 24 June 1966, Silberglied (1 female, MCZ); 23 March 1975, Bengston (1 male, FMNH); 26 March 1962, D. C. Ferguson (1 female, USNM); 10 September 1975, Rosenberg Coll. (1 male, 1 female, USNM); 6 mi S Lake Placid, 9–13 March 1968, A. Smetana (7 males, 6 females, CNC); *Hillsborough Co.*: Tampa, MacDill Field, 13 March 1943, B. Malkin (1 female, FMNH); Hillsboro River State Park, oak-palm, UV light, 5 August 1981, S. Peck (2 males, CNC); *Jackson Co.*: Marianna, 9 April 1954, A. K. Wyatt (1 female, FMNH); Fla. Caverns State Park, floodplain for UV, 11 August 1981, S. Peck (1 male, 1 female, CNC); *Lake Co.*: Tavares, spring 1956, W. Rosenberg (1 male, USNM); March 1955, W. Rosenberg (1 female, USNM); *Lee Co.*: Ft. Meyers, 1 April 1912 (1 female, AMNH); *Leon Co.*: Tall Timbers Res. Sta., UV trap, 29 June 1979, Wibmer & Marshall (1 male, 1 female, FMNH); Tallahassee, 4 March 1976,

G. B. Marshall (1 male, FMNH); *Marion Co.*: 8 mi E Ocala, 26 December 1977, E. D. Healy (1 female, FMNH); *Manatee Co.*: Oneco, blacklight trap, 12–13 April 1966, R. E. Woodruff (1 female, FSCA); *Pinellas Co.*: Tarpon Springs, at light, 21 March 1950, H. & A. Howden (1 female, USNM); *Sarasota Co.*: Myakka River State Park, UV light trap, 23 July 1976, C. W. O'Brien (1 female, FMNH); *Suwannee Co.*: Suwannee River State Park, UV light, 15 June 1981, S. Peck (1 male, CNC); *Volusia Co.*: Delano, 19 March 1953, H. Ramstadt (1 female, FMNH); 22 March 1954, A. K. Wyatt (3 males, FMNH); Edgewater, at light, 11 December 1939, L. A. Frost (1 male, MCZ); Sanford, April 1956, W. Rosenberg Coll. (1 female, USNM); 2 March 1961, C. W. Desin (1 female, FSCA). **Georgia**: no locality, F. C. Bowditch (1 female, MCZ); A. Feynes Coll. (1 female, CASC); *Clarke Co.*: 15 May 1929, Richards (1 female, AMNH); *Decatur Co.*: Bainbridge, 15–27 July 1909, J. C. Bradley (1 male, FMNH); *Forsyth Co.*: Gainesville, 14-V-II (1 female, USNM); *Lowndes Co.*: blacklight trap, 13 May 1963 (16 males, 26 females, FMNH); blacklight trap, 18 May 1963 (1 female, FMNH); *Ware Co.*: Waycross (6 mi SE) at light, 23–24 June 1955, H. S. Dybas (2 males, FMNH); light trap, 17 June 1967, R. C. Fox (1 female, AMNH). **Illinois**: *Union Co.*: Pine Hills Field Station, 15–22 May 1967, J. M. Campbell (2 males, CNC); Pine Hills, near Pine Hills campground, 7 May 1976, A. Smetana (1 female, CNC); *Vermilion Co.*: Danville, 12 June 1958, R. A. Scheibner (1 female, AMNH). **Indiana**: *Brown Co.*: The Bear Wallow, 6 June 1968, C. E. White & J. F. Brimley (1 female, CNC); *Tipecanoe Co.*: 29 June 1940, J. W. Green (1 female, CASC); *Lafayette*, 16 May 1963, E. J. Kiteley (1 male, CNC); *Wabash Co.*: 17 June 1937, H. S. Dybas (1 male, FMNH). **Iowa**: no locality, F. C. Bowditch (1 female, MCZ). **Kansas**: *Douglas Co.*: Lawrence, 7 October 1933, Blackwelder (1 female, USNM); *Labette Co.*: Oswego, night lights, 20 May 1970, G. F. Hevel (1 female, USNM); black light, 19 May 1970, Gary F. Hevel (1 female, USNM); *McPherson Co.*: McPherson, August, W. Khaus (1 female, AMNH); *Montgomery Co.*: Montgomery, 3 June 1963, N. & B. Maston (1 female, AMNH). **Kentucky**: no locality, Chas. Palm (1 female, AMNH); Hy. Edwards (1 female, AMNH); *Christian Co.*: J. M. Campbell (1 female, CNC); *Rowan Co.*: Morehead, 25 May 1975, L. E. Watrous (1 male, 4 females, FMNH); 1 July 1962, Freeman & Lewis (1 male, CNC). **Louisiana**: no locality (2 males, 1 female, FMNH); (2 females, AMNH); (2 females, CNC); A. T. Solsson (1 female, AMNH); F. A. Eddy (2 males, 1 female, MCZ); 1919 (1 female, MCZ); Casey (2 males, USNM); 1925, Casey (3 females, CASC); Fredrick Blanchard (1 male, MCZ); no parish, Bock, A. Fenyes (3 males, 3 females, CASC); *Concordia Pa.*: 5 mi W Ferriday, 2 May 1976, A. Smetana (1 male, CNC); *Claiborne Pa.*: Caney Lake near Minden, 3 July 1963, P. J. Spangler (1 male, USNM); *Jefferson Pa.*: New Orleans, 29 May 1948, M. Cazier (1 male, FMNH); at light, 19 May 1944, J. M. Hughes (1 female, CNC); Harahan, at light, 20 August 1944, H. Dybas (1 male, FMNH); 26 July 1944, H. Dybas (1 female, FMNH); *Lafayette Pa.*: Lafayette, 6 July 1963, D. Carlson (2 females, AMNH); *Madison Pa.*: Tallalah, 2 July 1930 (1 female, MCZ); *Ouachita Pa.*: Monroe, 17 June 1953, C. & P. Vaurie (1 female, AMNH); Monroe, 15 May 1929, Richards (1 female, AMNH); *Vermilion Pa.*: Gueydan, at light, 25 June 1925, E. Kalmbrach (1 female, USNM). **Maryland**: no county, Plummers Isl., 11 May 1905, Barber & Schwarz (1 female, USNM); at light, 26 June 1932, H. S.

Barber (1 male, USNM); 26 May 1908, E. A. Schwarz (1 female, USNM); at light, 29 June 1922, L. L. Buchanan (2 females, USNM); 26 April 1913, H. S. Barber (1 male, USNM); 10 April 1905, E. A. Schwarz (1 male, USNM); 18 January 1914, W. L. McAtee (1 male, USNM); 20 May 1903, W. V. Warner (2 males, USNM); 24 May 1912 (1 male, USNM); at light, 26 May 1914, E. A. Schwarz (1 male, USNM); 20 May 1903, W. V. Warner (1 male, AMNH); light trap, 28 July 1921, H. S. Barber (1 male, USNM); at light, 3 June 1923 (1 male, USNM); 23 May 1903 (1 female, USNM); 9 April 1905, E. A. Schwarz (1 female, USNM); 7 June 1913, Barber & Schwarz (1 female, USNM); 23 June 1921, H. S. Barber (1 female, USNM); 25 April 1921, H. S. Barber (2 females, USNM); 25 June 1932, H. S. Barber (1 female, USNM); *Calvert Co.*: Chesapeake Beach, UV light, 23 May 1970, M. Druckenbrod (1 male, 2 females, USNM); 9–4 (1 male, MCZ). **Mississippi**: no locality, F. Psota Coll. (1 male, 2 females, FMNH); *Grenada Co.*: Grenada, 15 June 1938, Henry Dybas (1 male, FMNH); *Hancock Co.*: Gulfport, July 1938, Blackwelder (1 male, AMNH); Clermont Harbor, 25 August 1965, H. R. Hepburn (1 male, CNC); *Harrison Co.*: Landon Newman Lumber Company, light trap, 17 June 1968, D. S. Chandler (3 males, 3 females, FMNH); *Lafayette Co.*: Oxford, 5 June 1949, H. V. Weems, Jr. (1 female, MCZ); *Leflore Co.*: Greenwood, 6 July 1971, D. Brzoska (2 males, FMNH); 4 June 1972, D. Brzoska (1 male, AMNH); 3 June 1972, D. Brzoska (1 male, AMNH). **Missouri**: no locality, Bowditch (1 female, MCZ); Eddy (1 female, MCZ); no county, Rankin, 30 May 1937, E. P. Meiners & J. W. Green (1 male, CASC); *Benton Co.*: near Warsaw, UV light, 15 May 1964, Robert L. Holtzman (1 female, AMNH); *Boone Co.*: 10 November 1938, W. S. Craig (1 male, CNC); *Franklin Co.*: Maramee State Park, 28 July 1975, K. Stephen (1 male, FMNH); *Hickory Co.*: Hermitage, 10 June 1971, D. Brzoska (2 males, 1 female, CNC). **New Jersey**: no locality, F. A. Eddy (1 male, MCZ); Casey (1 male, USNM); *Burlington Co.*: Atsion, 11 June 1945, J. W. Green (1 female, FMNH); 11 June 1945, J. W. Green (3 males, 8 females, CASC); 27 June 1946, J. W. Green (1 male, CASC). **North Carolina**: no locality (1 male, 1 female, MCZ); *Cleveland Co.*: 19 May 1965, T. N. Freeman (1 female, CNC); *Edgecombe Co.*: Rocky Mount, light, 10 November 1948 (1 female, USNM); *Granville Co.*: 3 mi E Oxford, UV light, 21 July 1972, M. Druckenbrod (1 male, 1 female, USNM); *Hoke Co.*: Southern Pines, 18 December 1914, A. H. Mancee (1 female, AMNH); 14 November, Casey (1 male, USNM); *Hyde Co.*: Ocracoke Isl., Ocracoke, 10–14 August 1972, A. Smetana (1 male, 1 female, CNC); *Rockingham Co.*: Reidsville, at light, 30 May 1973, J. S. Ashe (2 females, FMNH); 10 August 1973, J. S. Ashe (1 female, FMNH); *Wake Co.*: Raleigh, 6 October 1940 (1 female, CNC); 28 April 1942, R. C. Barnes (1 female, CNC); at light, 5 July 1948, M. W. Wing (1 male, FMNH); at light, 30 April 1919, R. E. Thompson (1 female, USNM). **Ohio**: no locality, Fredrick Blanchard (1 male, MCZ); *Athens Co.*: Athens, 25 May 1953, G. Miskimen (2 females, CASC); 2 June 1953, G. Miskimen (1 female, CASC); 25 April 1954, G. Miskimen (1 female, CASC); 25 May 1953, F. W. Stehr (2 males, CNC); 2 June 1953, F. W. Stehr (1 female, CNC); 28 May 1954, F. W. Stehr (2 males, 1 female, CNC); 6 April 1932, W. Stehr (1 female, CNC); 6 March 1932, W. Stehr (1 female, CNC); *Auglaize Co.*: St. Mary's, 1955, Karl Branesik (1 female, FMNH); *Delaware Co.*: 11 May, D. J. & J. N. Knull (1 female, CNC); *Franklin Co.*: Columbus, 13

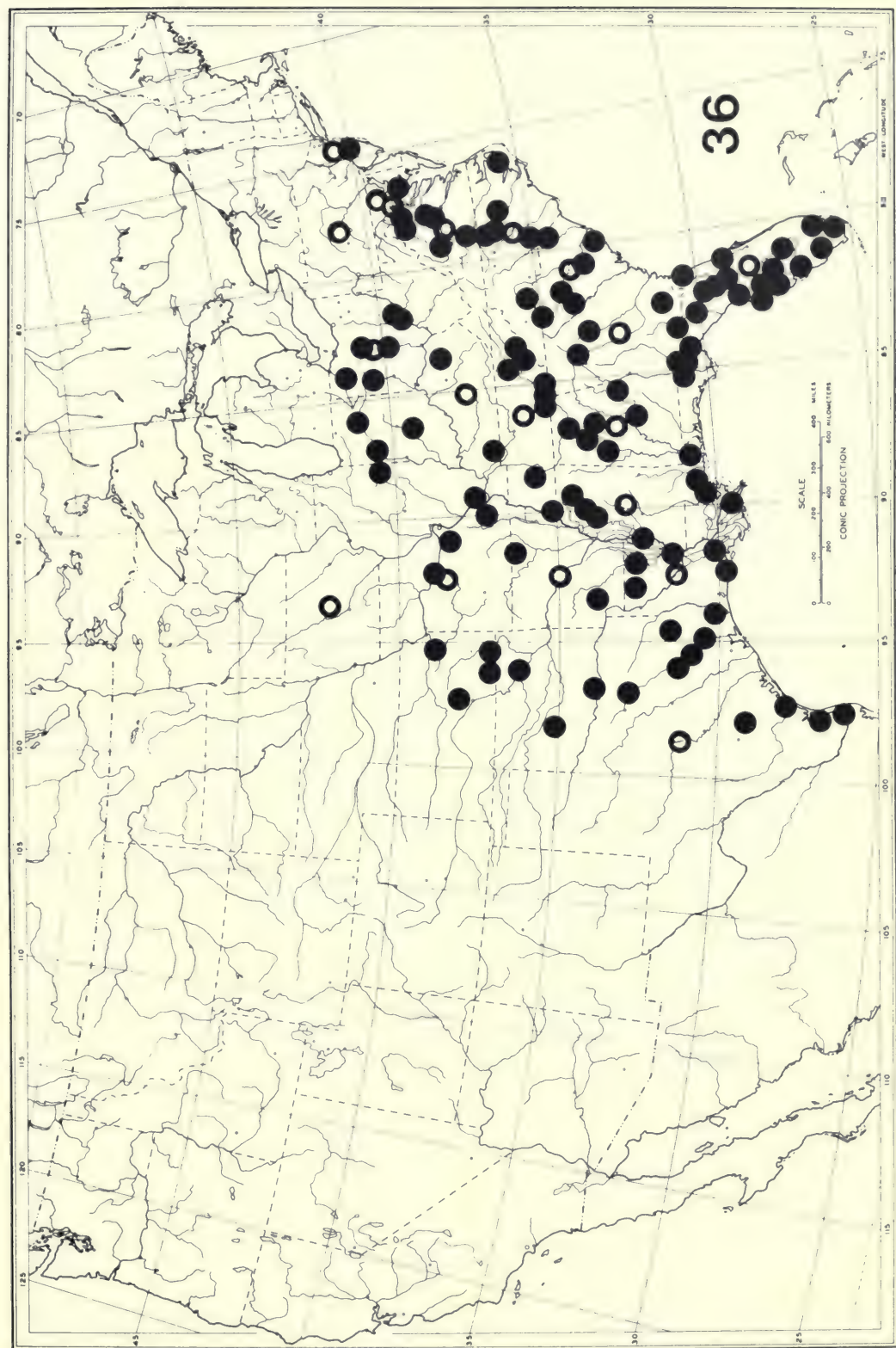


FIG. 36. *Pinophilus latipes* Gravenhorst, known distribution (O = state label only).

July 1930, Blackwelder (1 male, FMNH); 13 April 1902 (1 male, CNC); *Henry Co.*: Holgate, May 1941, C. R. Neswander (1 female, CNC); *Washington Co.*: Marietta, 15 June 1957, R. L. Fischer (1 male, AMNH). **Oklahoma:** *Caddo Co.*: Red Rock State Park, 26 July 1975, K. Stephen (1 female, FMNH); *Marshall Co.*: Lake Texoma (Willis) VOBS, at light, 11 July 1964, W. Suter (1 male, 1 female, FMNH); *Tulsa Co.*: Tulsa, 15 May 1939, E. K. Waering (1 female, CASC). **Pennsylvania:** no locality (1 female, MCZ); (2 males, 2 females, ZMHU); 1925, Casey (1 male, USNM). **South Carolina:** no locality (1 female, MCZ); Caraden, Roland Hayward (1 male, MCZ); *Aiken Co.*: Aiken, 23 June 1957, W. R. M. Mason (3 females, CNC); *Barnwell Co.*: Blackville, UV light trap, 21 April 1976, W. A. Jones (1 male, FMNH); *Charleston Co.*: 7 mi N of McClellanville, The Wedge Plantation, South Santee R., June 1977, E. G. & I. Munroe (2 males, 3 females, CNC); McClellanville, Wedge Plantation, South Santee R., 4–5 June 1977, E. G. & I. Munroe (1 female, CNC); *Dillon Co.*: Little Pee Dee State Park, 26 June 1976 (1 female, AMNH); *Newberry Co.*: (24 mi N) Newberry, 3 May 1973, W. Suter (3 males, FMNH); *Pickens Co.*: Clemson, light, 17 June 1967, R. C. Fox (1 male, AMNH); 25 May 1959, R. C. Fox (1 male, AMNH); light (1 female, FMNH). **Tennessee:** no locality, 10 April 1912, F. Psota (1 male, FMNH); 14 October 1912, F. Psota (1 female, FMNH); *Blount Co.*: Cades Cove, Great Smoky Mt. National Park, N.C., 5 November 1956, W. J. Brown (1 female, CNC); *Bradley Co.*: Cleveland, 7 May 1952, Cazier, Gertch & Schrammel (1 female, AMNH); *Franklin Co.*: Sewanee, at light, 7–14 June 1958, H. R. Steeves, Jr. (1 female, FMNH); *Hamilton Co.*: East Ridge, Chapin Sanctuary, 3 May 1952, O. Peck (1 male, 3 females, CNC); *Knox Co.*: Knoxville, 27 May 1954, H. & A. Howden (1 female, USNM); 20 April 1955 (1 male, CNC); *Madison Co.*: Jackson, light trap, 29 June 1955, W. Rosenberg (2 males, 1 female, USNM); *Morgan Co.*: Burrville, 3 July 1955, B. Benesh (1 female, FMNH); 30 May 1956, B. Benesh (1 female, FMNH); 13 May 1956, B. Benesh (1 female, FMNH); 16 June 1956, B. Benesh (1 female, FMNH); 8 June 1956, B. Benesh (1 male, FMNH); *Sevier Co.*: Gatlinburg, alt. 1200, 18 May 1950, H. & A. Howden (1 female, USNM); *Shelby Co.*: Memphis, 10 April 1912, F. Psota (1 male, FMNH); 25 July 1938, W. Stehr (1 female, CNC). **Texas:** no locality, F. C. Bowditch (1 male, 1 female, MCZ); Eddy (3 males, 2 females, MCZ); Casey (3 males, 4 females, MCZ); Eddy (3 males, 2 females, MCZ); Casey (3 males, 4 females, USNM); (2 males, FMNH); *Bexar Co.*: San Antonio, Medina Lake, 3 June 1927, H. Notman (1 female, CNC); *Cameron Co.*: 12 October 1960 (1 female, CNC); Brownsville, 9 May 1908 (1 female, CNC); *Dallas Co.*: Dallas (7 males, 5 females, MCZ); *Houston Co.*: 11 mi E Ratcliff, 24 April 1976, A. Smetana (1 male, CNC); *Kenedy Co.*: Armstrong, King Ranch, 10 September 1960 (1 female, CNC); *Nacogdoches Co.*: at light, 24 June 1964, J. Branson (1 male, FMNH); at light, 29 October 1972 (1 male, FMNH); April 1960, entomology class (1 male, FMNH); 21 July 1971, Carl Burfield (1 female, FMNH); *Orange Co.*: 20 June 1949, W. C. Stehr (1 female, CNC); *Polk Co.*: Livingston, at light, 6 June 1964, L. C. Amings (1 male, FMNH); *San Patricio Co.*: Lake Corpus Christi, 3 mi S Swinney Switch, 22 July 1974 (1 female, FMNH); *Trinity Co.*: 12 mi SW Lufkin, 22 April 1976, A. Smetana (3 males, 5 females, CNC). **Virginia:** no locality, Liebeck (1 male, MCZ); *Albemarle Co.*: Charlottesville, at light, 8 May 1958, H. R. Steeves, Jr. (1 male,

FMNH); *Chesapeake Co.*: Dismal Swamp, Lake Drummond U.S., 8–9 June 1974, Don & Mignon Davis (1 male, USNM); 6–7 July 1962, A. B. Gurney (1 female, USNM); *Fairfax Co.*: Fairfax, George Mason University, sandy area, 15 May 1973, R. W. Baumann (1 female, USNM); under log in sandy area, 23 January 1915, A. Nicolay (1 female, AMNH); Falls Church, 10–15 (2 males, MCZ); 9–30 (2 females, MCZ); *Louisa Co.*: blacklight trap, South Anna R. at U.S. Highway 522, 5 July 1928, J. R. VeShel (1 female, MCZ); *Nelson/Amherst Co.*: Piney River, 27 June 1950, W. Rosenberg (1 male, USNM); *Page Co.*: 27 April 1946, B. Malkin (1 male, FMNH); Rte. 340, 3 km N Shenandoah, ex flood debris, 13 June 1982, Bosquet & Davies (1 male, 1 female, CNC); *Spotsylvania Co.*: Fredericksburg, Vandyke (1 male, CASC); *Virginia Beach Co.*: Princess Anne, 3 mi S Creeds, UV light, 21 August 1971, M. Druckenbrod (1 female, USNM). **Washington, D.C.:** no locality, Charles Palm (1 male, FMNH); M. L. Linell (1 male, FMNH); electric light, 6–15 (1 male, FMNH); (1 male, FMNH); Stablefield Fobs, 20 March 1933, E. Meyers (1 female, USNM); 16 May 1906 (1 female, USNM).

Pinophilus opacus LeConte

Pinophilus opacus LeConte, 1863, p. 49; Blatchley, 1910, p. 440; Casey, 1910, p. 196.

Pinophilus confusus Fall, 1932, p. 56, NEW SYNONYM.

Pinophilus parvipennis Casey, 1910, p. 196, NEW SYNONYM.

DIAGNOSIS—*Pinophilus opacus* may be distinguished from other species of *Pinophilus* by the combination of the head and pronotum with very few micropunctures, the 9th abdominal sternum of the male narrowed evenly to apex, the flagellum not coiled within base of aedeagus, the flagellar orifice located at base of sclerotized portion of median lobe, the median lobe very elongate and slender, and by the elytral length subequal to or only slightly longer than pronotum (see table 1).

DESCRIPTION—Body dark reddish brown to black; anterior margin of head, labrum, mandibles, and apex of abdomen reddish brown; antennae, maxillary palps, and legs yellowish brown. Length 9–13 mm; measurements of pronotum and elytra given in Table 1.

Head dorsum with relatively few umbilicate punctures and very few micropunctures, intermediate-sized micropunctures absent; impressions of umbilicate punctures with microsculpture, especially those toward base of head. Antennae, mouthparts, and other features of the head as described for *Pinophilus latipes*.

Pronotum with numerous umbilicate punctures; surface between umbilicate punctures smooth and shiny, without micropunctures;

impressions of umbilicate punctures without microsculpture. Remainder of prothorax as described for *P. latipes*. Legs, elytra, mesosternum, and abdominal segments 3–7 as described for *P. latipes*.

Female—Abdominal sternum 8 with posterior margin shallowly produced; sternum 9 narrow, with shallow V-shaped notch at apex and pair of large setae anterior to notch.

Male—Abdominal sternum 8 with posterior margin strongly produced, apex narrowly rounded; sternum 9 slender, gradually narrowed to apex, very slightly constricted before apex, apex blunt (figs. 39–40). Aedeagus (figs. 37–38) with median lobe very elongate and slender, slightly swollen medially, otherwise narrowed evenly to apex; dorsum of median lobe not grooved apically; parameres short and stout, but not greatly reduced; inner margins with tooth near middle (very similar to *P. latipes*); paramere without ventral flange; flagellum long and nearly straight, not greatly coiled within base of aedeagus; flagellar foramen located near base of median lobe; dorsal process absent; base of aedeagus not constricted.

RELATIONSHIPS—See discussion for *Pinophilus gracilis*.

TYPE SPECIMENS—The LeConte collection at the Museum of Comparative Zoology contains two specimens (1 male, 1 female) belonging to the type series of *Pinophilus opacus*. Both bear an orange dot label, indicating a southeastern United States distribution. In the original description, LeConte gave Georgia as the type locality. The male specimen is herein designated as the lectotype. The genitalia have been dissected and stored in a glycerine vial with the specimen. Segments 3–11 of the left antennae and segments 8–11 of the right antennae are missing; otherwise, the lectotype is in perfect condition.

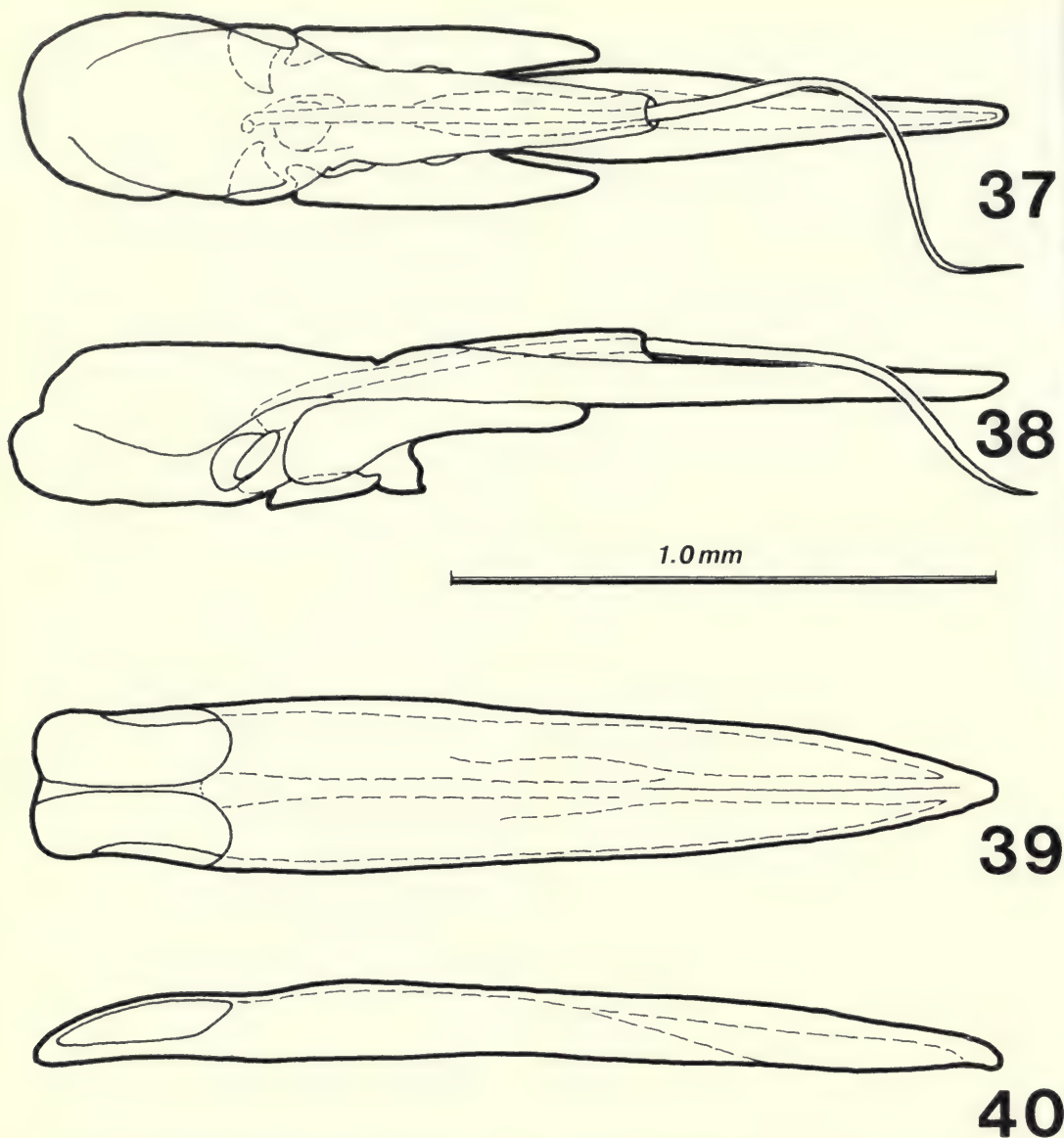
The Fall collection at the Museum of Comparative Zoology contains five specimens (2 males, 3 females) under the name *Pinophilus confusus*. From the original description, it is clear that Fall intended two of the specimens to be the type series. Both are females, and are labeled “Cape Hatteras, North Carolina, Jan. 1903, F. Sherman collector”. Since Fall did not designate a holotype, the specimen bearing his type label is herein designated as lectotype. Fall distinguished *P. confusus* from other *Pinophilus* species based in part on the size of the elytra and on the distinctness of the midlongitudinal impunctate space on the pronotum. Both of these characters vary considerably within *P. opacus*. Other characters mentioned by Fall are

not sufficient to separate *P. confusus* from *P. opacus*.

The Casey collection at the United States National Museum, Washington, D.C., contains one female specimen under the name *Pinophilus parvipennis*. From the sex and locality data, it is clear that Casey intended this to be the holotype specimen. Casey distinguished *P. parvipennis* from other *Pinophilus* species, based in part on the size of the elytra and on the dispersion of impunctate space on the prothorax. Both of these features vary considerably within *P. opacus*. Additional characters discussed by Casey are not sufficient to distinguish among species of *Pinophilus*.

DISTRIBUTION—*Pinophilus opacus* occurs throughout eastern North America from Ohio, Indiana, Illinois, and northern Missouri south through Florida and as far west as eastern Kansas, eastern Oklahoma, and Arizona (fig. 41).

SPECIMENS EXAMINED—We have examined 136 specimens from the following localities: **UNITED STATES:** **Alabama:** Lee Co.: Opelika, 18 January 1974, E. J. Kiteley (1 male, CNC); Auburn, 6 April 1972, E. J. Kiteley (1 male, CNC); 21 January 1974, E. J. Kiteley (1 male, CNC); **Mobile Co.:** Mobile, June 1952, R. Rosenberg (1 female, USNM); 2 April 1911, R. P. Dow (1 male, CNC); **Tuscaloosa Co.:** Tuscaloosa, at light, 2 May 1953, B. Valentine (1 female, AMNH). **Arizona:** no locality (1 male, AMNH); **Cochise Co.:** Southwestern Research Station near Portal, August 1973, Rosenberg (1 female, USNM). **Arkansas:** no locality, Liebeck (1 male, 3 females, MCZ); (2 males, FMNH); southwest, Chas. Palm (1 male, 1 female, AMNH). **Florida:** no locality, F. C. Bowditch (1 female, MCZ); **Allachua Co.:** Paradise Key, 4 April 1925 (1 female, MCZ); Gainesville, 22 August 1956, H. A. Denmark (1 female, CNC); **Collier Co.:** 8 mi SE Naples, UV light, 12 July 1972, M. Druckenbrod (1 male, 1 female, USNM); Coronado Bch., in wash-up, 11 May 1939, C. A. Frost (1 female, MCZ); 5 February 1939, C. A. Frost (1 female, MCZ); in wash-up, 5 March 1939, C. A. Frost (1 male, MCZ); **Columbia Co.:** O’Leno St. Pk., forest litter, berlese, 29 July 1971 (1 male, CNC); **Dade Co.:** Homestead, 17 November 1951, R. Mansveti (1 male, USNM); Everglades National Park, Palma Vista Hammock (berlese litter ex sink pocket), 1 May 1974, W. Suter (2 males, 3 females, FMNH); Everglades National Park, Palma Vista Hammock (gumbolimbo swamp), 27 August 1965, W. Suter (2 males, 2 females, FMNH); **Franklin Co.:** 3 mi NW Alligator Point, berlese sand pine and oak litter, 12 October 1976, O’Brien & Marshall (1 female, FMNH); 3 mi NW Alligator Point, berlese sand pine and oak litter, 12 December 1975, G. B. Marshall (2 females, FMNH); Haulover (1 male, MCZ); **Highlands Co.:** Lake Placid, Archbold Biological Station, at UV light, 24 June 1966, R. Silberglied (1 male, MCZ); 15–30 July 1948, A. B. Klotts (4 males, 1 female, AMNH); 29 April 1964, R. W. Hodges (1 male, USNM); 29 April 1977, William Rosenbury (1 female, USNM); April 1956, C. C. Hoff (1 female, AMNH); 4 mi W Venus Fisheating Creek (litter under water hyacinth), 30 March 1967, W. Suter (3 males, 3 females, FMNH); Parker Island, baygall,



FIGS. 37-40. *Pinophilus opacus* LeConte, aedeagus. 37, median lobe, dorsal aspect; 38, median lobe, lateral aspect; 39, abdominal sternum IX, ventral aspect; 40, abdominal sternum IX, lateral aspect.

berlese: bay buttress, 25 August 1975, W. Suter (1 male, FMNH); (southeast) Parker Island, baygall (floor litter—between hammocks), 17 January 1975, W. Suter (1 female, FMNH); Archbold Biological Station, 8 mi S Lake Placid, 2-15 February 1970, V. Roth (4 males, FMNH); Hammock State Park, berlese debris along cypress swamp and hammock, 27 March 1967, W. Suter (1 male, 1 female, FMNH); Sebring, 10 August 1930, C. T. Parsons (1 female, MCZ); 6 mi S Lake Placid, 9-13 March 1968, A. Smetana (1 male, CNC); A. Smetana (1 male, CNC); Hillsborough Co.: Tampa, 24 April, F. C. Bowditch (1 female, MCZ); 20 April, F. C. Bowditch (1 female, MCZ);

24 April, J. LeConte (1 female, MCZ); Leon Co.: 23 March 1971, Lee Herman (1 female, AMNH); Tallahassee, ex mixed hardwood litter, 6 October 1977, C. W. O'Brien (1 male, FMNH); berlese hardwood litter, 2 December 1976, G. B. Marshall (2 males, FMNH); 27 October 1976, J. D. Justice (1 female, FMNH); 21 January 1976, G. B. Marshall (2 females, FMNH); berlese mixed hardwood litter, 28 June 1976, Marshall & Justice (1 male, 1 female, FMNH); berlese hardwood litter, 21 January 1976, G. B. Marshall (1 male, FMNH); 4 March 1976, G. B. Marshall (2 males, FMNH); Marion Co.: Upper Key Largo, litter and pack rat nest, 5 October 1973, E. F. Reik (1 male,

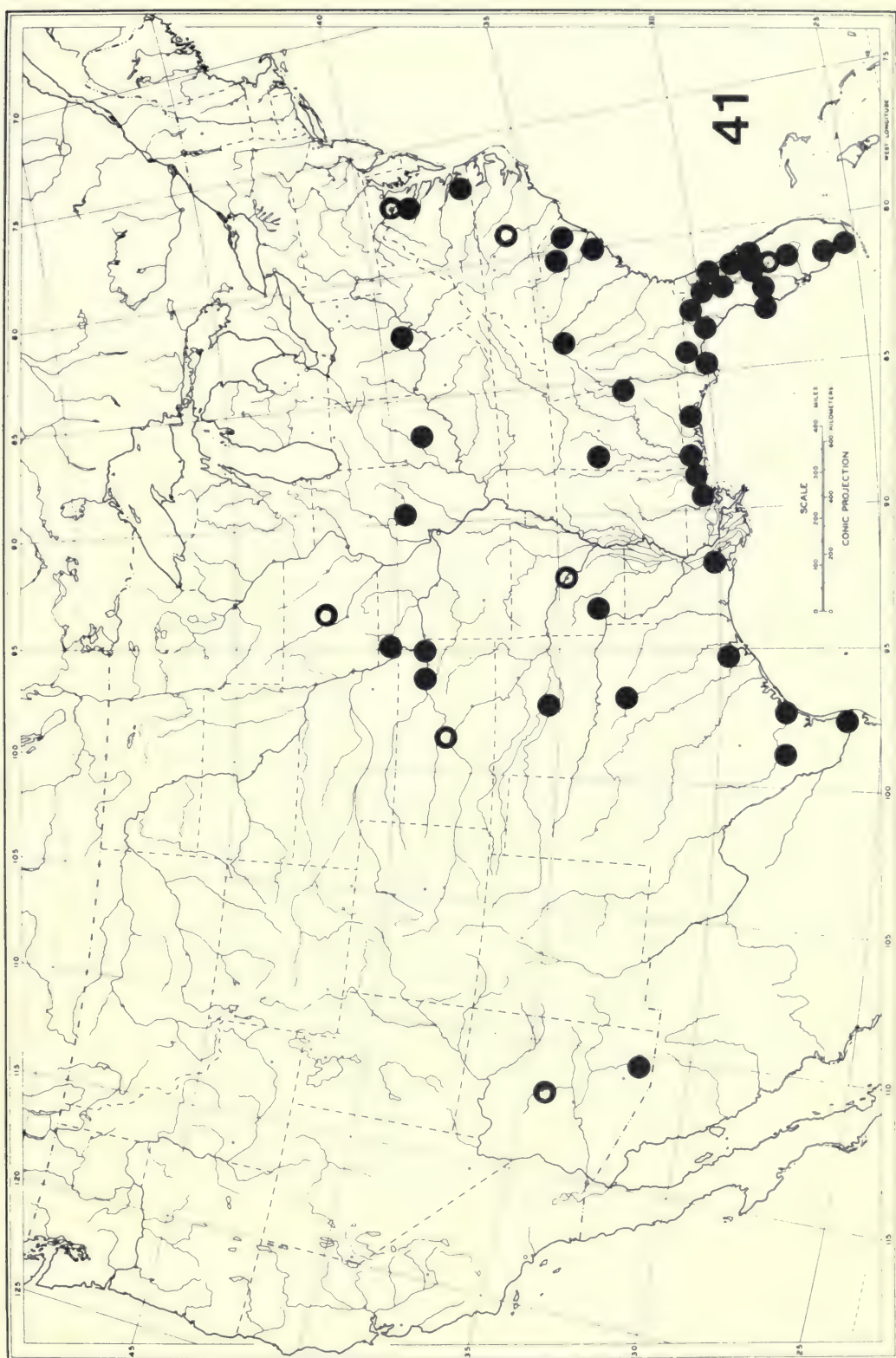
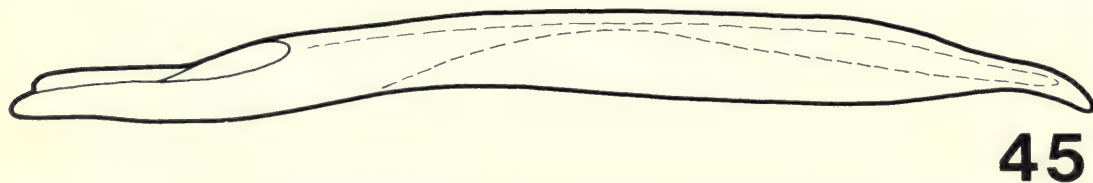
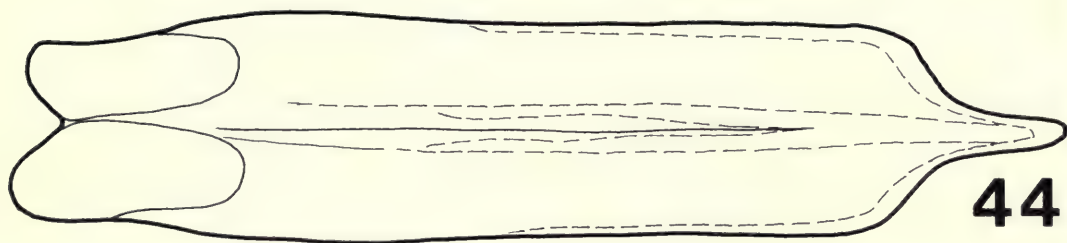
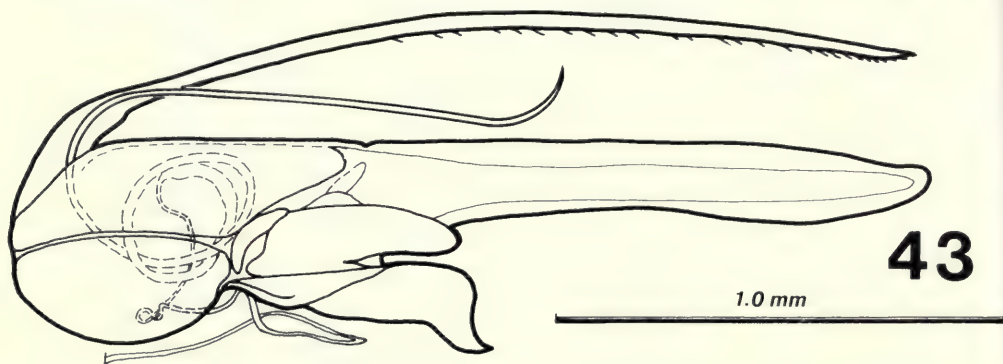
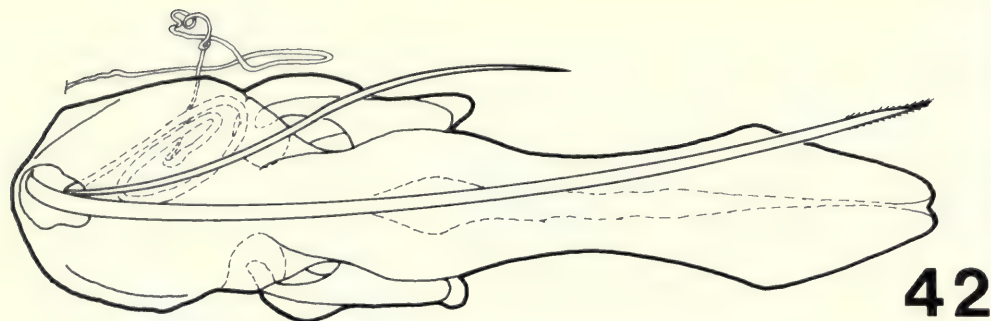


FIG. 41. *Pinophilus opacus* LeConte, known distribution (○ = state label only).



FIGS. 42-45. *Pinophilus parvus* LeConte, aedeagus. 42, median lobe, dorsal aspect; 43, median lobe, lateral aspect; 44, abdominal sternum IX, ventral aspect; 45, abdominal sternum IX, lateral aspect.

FMNH); 14 mi E Lynne, berlese sand pine, oak, and palmetto litter, 25 January 1974, C. W. O'Brien (3 females, FMNH); *Monroe Co.*: 5 mi S North Key Largo (floor at log), 28 August 1965, W. Suter (1 female, FMNH); Upper Key Largo, berlese hammock litter, 18 March 1975, C. W. O'Brien (1 female, FMNH); berlese hammock litter

and pack rat nest, 5 October 1973, E. F. Reik (1 male, FMNH); Everglades National Park, 31 March 1960, R. M. Baranowski (1 male, MCZ); *Orange Co.*: Winter Park, 1 May, E. M. Davis (2 females, MCZ); Apopka, fern, 18 October 1946 (1 male, CNC); *Okaloosa Co.*: Ft. Walton Bch., 20 March 1979, E. J. Kiteley (2 males, CNC); 20

February 1973, E. J. Kiteley (1 male, CNC); 30 March 1979, E. J. Kiteley (1 male, CNC); Destin, 2 March 1976, E. J. Kiteley (1 male, CNC); 30 January 1976, E. J. Kiteley (1 male, CNC); *Pinellas Co.*: Dunedin, 4 April 1923, H. C. Fall (1 male, MCZ); Tarpon Springs, lights, 20 March 1950, H. & A. Howden (1 female, USNM); *Putman Co.*: Palatka, 13 February 1975, F. A. Eddy (1 male, MCZ); *Seminole Co.*: logwood on road to Country Club, 23 August 1965, Suter (1 female, FMNH); *Taylor Co.*: Williams Landing, 2–14 July 1967, R. Smith (1 female, USNM). **Georgia**: *Stephens Co.*: Toccoa, 17 August 1939 (2 females, FMNH). **Illinois**: *Sangamon Co.*: Springfield, 29 March 1927, Orland Park (1 female, FMNH). **Indiana**: *Monroe Co.*: Morgan, Monroe State Forest, ex litter at stream edge in open pasture, 18 April 1981, L. Watrous (1 male, 1 female, FMNH). **Iowa**: no locality (1 female, USNM). **Kansas**: no locality, Fredrick Blanchard (1 male, MCZ); *Douglas Co.*: 900 feet, F. H. Snow (1 male, FMNH); *Pottawatomie Co.*: Onaga, 27 April 1923, Crevecoeur (1 female, CASC). **Louisiana**: *Lafayette Pa.*: Lafayette, 24 July 1973, W. Rosenberg (1 male, USNM). **Mississippi**: *Hancock Co.*: Bay Saint Louis (Diamond Head), 22 February 1978, W. E. Steiner (1 female, USNM); *Harrison Co.*: Gulfport, at light, 16 September 1968, L. Williams (2 females, AMNH). **Missouri**: *Nodaway Co.*: Graham, 5 August 1933, C. H. Seever (1 female, FMNH). **North Carolina**: no county, Cape Hatteras, January 1903, F. Sherman (2 females, MCZ). **Ohio**: *Hocking Co.*: 3 mi W 33 on 116, 12 April 1975, L. E. Watrous (1 female, FMNH). **Oklahoma**: *Cleveland Co.*: S of Norman, Oliver Woods stage IV log, 5 April 1969, W. Suter (1 male, 2 females, AMNH). **South Carolina**: *Colleton Co.*: 13 October 1966, R. E. Widdows (1 female, FMNH); *Florence Co.*: Florence, 9 March 1938, C. A. Frost (1 male, MCZ); 14 March 1938 (1 female, MCZ); *Sumter Co.*: Sumter, 29 October 1966, R. E. Widdows (1 female, FMNH). **Texas**: *Cameron Co.*: 15 mi N of Brownsville, 1 mi E of Russeltown, willow fringe of pond, 9 April 1969, R. W. Suter (2 females, AMNH); *Dallas Co.*: Dallas (1 female, MCZ); *Harrison Co.*: Houston, 8–20 February 1967, A. Blanchard (1 female, USNM); *La Salle Co.*: Chaparral Wildlife Management Area nr Artesia Wells, 12 June 1972, Barry Wright (1 female, CNC); *San Patricio Co.*: Welder Wildlife Refuge nr Sinton, 4–7 August 1963, A. T. Howden (1 female, CNC). **Virginia**: *Chesapeake Co.*: W. Bowers Hill, ex pine-maple-cane swamp litter, 4 June 1965, W. Suter (1 female, FMNH); *Fairfax Co.*: Falls Church, 30 September (1 female, MCZ). **WASHINGTON, D.C.**: no locality, March (1 male, MCZ).

***Pinophilus parvus* LeConte**

Pinophilus parvus LeConte, 1863, p. 48; Casey, 1910, p. 194; Sharp, 1886, p. 621. *Pinophilus texanus* Casey, 1910, p. 195, NEW SYNONYM. *Pinophilus trajectus* Casey, 1910, p. 195, NEW SYNONYM.

DIAGNOSIS—*Pinophilus parvus* may be distinguished from other species of *Pinophilus* by the combination of numerous micropunctures on the pronotum and head (fig. 46), the apex of the male 9th abdominal sternum abruptly constricted, slender

and slightly upcurved, the parameres of the aedeagus very reduced, the dorsal process of the aedeagus very elongate and slender, the flagellar opening located at the base of the aedeagus, and by the form of the median lobe.

DESCRIPTION—Body dark reddish brown to black; anterior margin of head, labrum, mandibles, and apex of abdomen reddish brown; antennae, maxillary palps and legs yellowish brown. Length 10.0–14.5 mm; measurements of pronotum and elytra given in Table 1.

Head dorsum with large umbilicate punctures as described for *Pinophilus latipes*, but without the intermediate-sized punctures; micropunctures much more numerous than *P. latipes*. Gular sutures similar to *P. latipes*, but more widely separated at point of narrowest separation. Antennae, mouthparts, and other features of the head as described for *P. latipes*.

Pronotum similar to *Pinophilus latipes* in density of large umbilicate punctures, but with many more micropunctures. Other features of prothorax as described for *P. latipes*. Legs, elytra, mesosternum, and abdominal segments 3–7 as described for *P. latipes*.

Female—Abdominal sternum 8 with posterior margin strongly produced, apex rounded; sternum 9 with notch at apex deep and rounded (sterna 8 and 9 very similar to *P. densus*).

Male—Abdominal sternum 8 with posterior margin strongly produced, apex truncate; sternum 9 broad, apex abruptly constricted and drawn out to a slender, shallowly upcurved point (figs. 44–45). Aedeagus (figs. 42–43) with median lobe elongate, sides broadly concave, apex evenly narrowed and minutely notched; dorsum of median lobe grooved toward apex; parameres greatly reduced, median tooth present; ventral flange of paramere well developed; flagellum elongate and coiled within base of aedeagus; flagellar foramen basal; dorsal process present; basal portion of aedeagus not constricted.

RELATIONSHIPS—See discussion of *Pinophilus densus*.

TYPE SPECIMENS—The type series of *Pinophilus parvus* consists of three specimens (2 males, 1 female) in the LeConte collection at the Museum of Comparative Zoology. All three bear an orange dot label, indicating a southwestern United States distribution. One male is herein designated as lectotype. The aedeagus is partially exposed and therefore not dissected.

The Casey collection at the United States National Museum, Washington, D.C., contains one

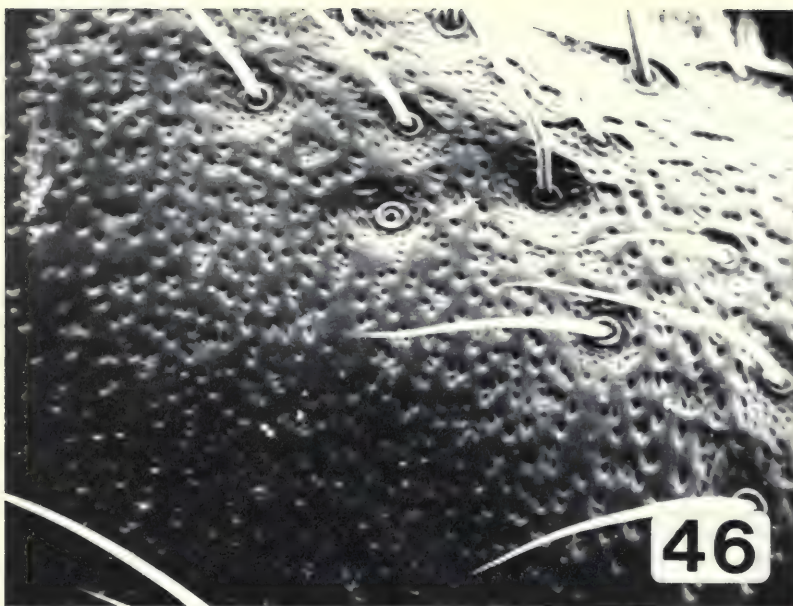


FIG. 46. *Pinophilus parvus* LeConte, dorsum of head, minute punctures, 230 $\times$.

male specimen under the name *Pinophilus texanus*. The specimen bears a label indicating locality as "Tex"; however, in Casey's original description, he states that the holotype locality is Austin, Texas. Casey based his original description of *P. texanus* on differences on the spacing of pronotal punctures and elytral length. Such variation exists within *P. parvus* itself. Other differences mentioned are very subtle, none differing to the point of separating *P. texanus* from *P. parvus* as separate species.

The Casey collection at the United States National Museum, Washington, D.C., contains one male specimen under the name *Pinophilus trajectory*. The specimen bears a label indicating locality as "Tex"; however, in his original description, Casey states that the holotype locality is El Paso, Texas. Using differences in body size and elytral punctures, Casey separated *P. trajectory* from other *Pinophilus* species. These differences fall well within the range of variance found in *P. parvus*. Additional taxonomic features attributed to *P. trajectory* are not sufficient to distinguish species of *Pinophilus*.

DISTRIBUTION—*Pinophilus parvus* occurs primarily in the southeastern states of the United States. Specimens have been recorded from Arizona, Illinois, Indiana, Kansas, Maryland, and New Jersey, but most of the specimens were collected in states bordering the Gulf of Mexico (fig. 47).

SPECIMENS EXAMINED—We have examined 338 specimens from the following localities: **UNITED STATES:** **Alabama:** no county, Spring Hill, H. P. Loding (1 female, MCZ); **Mobile Co.:** Mobile, 20–21 April 1957, H. & A. Howden (1 female, CNC). **Arizona:** **Gila Co.:** 12 mi NE Roosevelt, Three Bar Wildlife Area, June 1972, W. Rosenberg (1 female, USNM); **Palm (1 female, AMNH); Graham Co.:** Aravaipa Canyon, 900 m, 24 July 1976, J. M. Campbell (1 male, CNC); **Pima Co.:** San Xavier, near Tucson, 24 July 1916, Clark (1 male, AMNH). **Florida:** no locality, Fredrick Blanchard Coll. (1 female, MCZ); (1 male, AMNH); 1925, Casey (1 male, MCZ); **Coronado Beach,** in wash-up, July 1939, H. C. Fall (1 female, MCZ); **Alachua Co.:** Gainesville, 23 June 1959, R. E. Woodruff (1 female, MCZ); 28 March 1960 (1 male, CNC); light trap, 29–31 March 1960, H. F. Howden (3 males, CNC); 29 March 1960, H. F. Howden (1 female, CNC); 1 April 1960, H. Howden (1 male, CNC); blacklight trap, 8–12 June 1968, E. Woodruff (6 males, 3 females, FSCA); 27–29 April 1968, E. Woodruff (3 males, 1 female, FSCA); 14 March 1963, R. E. Woodruff (1 male, FMNH); **Brevard Co.:** Melbourne, 5 July 1909 (1 female, CASC); Titusville, light, 11 March 1958, Howden & Howell (1 female, CNC); **Broward Co.:** Everglades, Andytown, 2 March 1968, A. Smetana (1 male, CNC); **Collier Co.:** Collier Seminole State Park, UV light trap, 25 May 1976, O'Brien & Marshall (1 female, FMNH); **Dade Co.:** Biscayne Bay, A. T. Slosson (1 male, AMNH); Homestead, June 1929, Darlington (4 males, 1 female, MCZ); lights, 4 May 1951, H. & A. Howden (1 female, USNM); Everglades, Coopertown, 29 February 1968, A. Smetana (1 male, 1 female, CNC); **Duval Co.:** Jacksonville, October 1943, E. S. Ross (1 female, CASC); **Hernando Co.:** Brooksville, at light, 21 June 1955, Dybas (1 male, FMNH); 9 July 1944, F. G. Werner (1 male, MCZ); Brooksville, 20–30 January 1940, Van Dyke Coll. (2 males, 1 female, CASC); **Highlands**

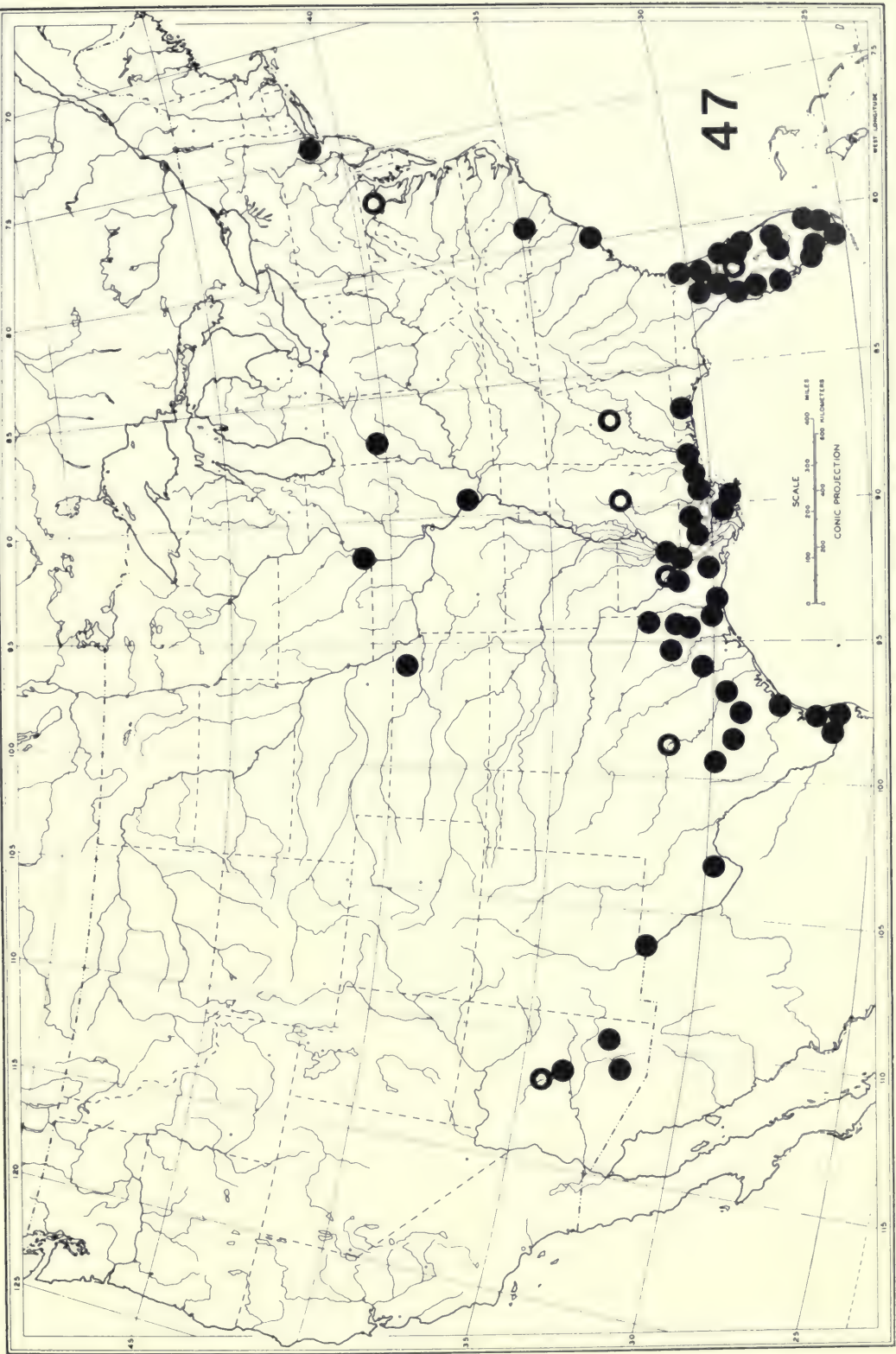


FIG. 47. *Pinophilus parvus* LeConte, known distribution (O = state label only).

Co.: 28 February 1975, J. L. Bengston (1 male, FMNH); Archbold Biological Station, 23 May 1949, A. & B. Patterson (1 female, FMNH); 8 April 1975, W. Rosenberg (1 female, USNM); 14 April 1975, W. Rosenberg (1 female, USNM); 23 April 1967, D. E. Bright (1 female, CNC); 24 April 1967, D. E. Bright (1 female, CNC); UV black light, 12 April 1966, R. Silberglied (1 female, MCZ); Lake Placid, 4 April 1975 (1 female, USNM); 27 April 1977, W. Rosenberg (1 female, USNM); 28 February 1975, J. L. Bengston (1 female, FMNH); at light, 13 June 1945, H. S. Dybas (1 female, FMNH); 2 April 1975, J. L. Bengston (1 female, FMNH); 22 May 1949, A. & B. Patterson (1 male, 1 female, FMNH); 12–19 June 1955, H. S. Dybas (1 male, 2 females, FMNH); 20 April 1975, J. L. Bengston (1 female, FMNH); 12 February 1975, J. H. Bengston (1 female, FMNH); 30 March 1975, J. H. Bengston (1 male, FMNH); 6 February 1975, J. H. Bengston (1 male, FMNH); 16 February 1975, J. H. Bengston (2 females, FMNH); 18 January 1975, W. Suter (1 female, FMNH); UV black light, 12 June 1966, R. Silberglied (3 females, MCZ); 24 June 1966, R. Silberglied (1 male, MCZ); 6 mi S Lake Placid, 9–13 March 1968, A. Smetana (7 males, 11 females, CNC); 10 mi N Lake Placid, 12 March 1968, A. Smetana (1 male, 1 female, CNC); Lake Istokpoga nr Lake Placid, 8 March 1968, A. Smetana (3 males, 13 females, CNC); 7 March 1968, A. Smetana (10 males, 4 females, CNC); 9 March 1968, A. Smetana (1 female, CNC); 13 March 1968, A. Smetana (2 males, 1 female, CNC); 12 March 1968, A. Smetana (2 males, CNC); 7 mi W Brighton, 5 March 1968, A. Smetana (1 male, CNC); 1 mi W Brighton, 4 March 1968, A. Smetana (1 female, CNC); *Hillsborough Co.*: Tampa, 1925, Casey Bequest (1 female, MCZ); Macdill Field, 22 May 1943, B. Malkin Coll. (1 female, FMNH); Hillsborough River State Park, oak-palm, UV light, 5 August 1981, S. Peck (1 male, CNC); *Lake Co.*: Leesburg, 8 September 1961, C. H. Curran (1 female, AMNH); 1–11 March 1954, M. Statham (1 male, AMNH); 2 mi S Tavares, blacklight trap, 25 April 1967, E. Woodruff (1 male, fSCA); *Lee Co.*: Ft. Meyers, 30 April 1912 (1 female, AMNH); *Monroe Co.*: Lower Matecumbe Key, algal drift, 23 March 1982, W. S. Suter (1 male, FMNH); Flamingo, Everglades National Park, 4 January 1971, L. Masner (2 females, CNC); *Okaloosa Co.*: Ft. Walton Beach, 18 March 1980, E. J. Kiteley (1 male, 1 female, CNC); Destin, 5 December 1980, E. J. Kiteley (2 males, 3 females, CNC); 16 February 1976, E. J. Kiteley (1 female, CNC); 3 March 1976, E. J. Kiteley (1 male, 1 female, CNC); 27 February 1981, E. J. Kiteley (1 female, CNC); 25 March 1980, E. J. Kiteley (1 male, 1 female, CNC); 28 February 1975, E. J. Kiteley (1 female, CNC); *Okeechobee Co.*: Sebring, 2–7 March 1939, F. E. Luz (1 female, AMNH); *Orange Co.*: Winter Park, 1 April, E. M. Davis (male, FMNH); *Putnam Co.*: Waleka, under boards near fish pond, 7 July 1980, L. Watrous (1 female, FMNH); *Sarasota Co.*: Myakka River State Park, light trap, 23 July 1976, C. W. O'Brien (1 male, 4 females, FMNH); *Volusia Co.*: Enterprise, 26 May, Bowditch Coll. (2 females, MCZ); Sanford, blacklight trap, 2 March 1961, W. Desin (2 females, fSCA); Edgewater, 12 March 1938, C. A. Frost (1 male, MCZ). **Illinois**: *Union Co.*: Pine Hills, 11 April 1986 (1 female, CNC); Pine Hills Field Sta., berlese sample, leaf debris in roadside ditch, 15–22 May 1967 (1 female, CNC). **Iowa**: *Henry Co.*: Mt. Pleasant, 4 April 1927, Kysue (1 female, AMNH); Houston (1 male, AMNH). **Kansas**: *Pottawatomie Co.*: Manhattan, 28 June 1950, H. E. Evans (1 male, AMNH). **Louisiana**: no locality

(1 female, AMNH); (1 male, CNC); 1925, Casey Bequest (2 males, 2 females, MCZ); Eddy Coll. (1 male, MCZ); (1 male, 1 female, FMNH); F. N. Young Coll. (1 male, MCZ); F. C. Bowditch (1 male, MCZ); no parish, Bock, A. Fenyes Coll. (2 females, CASC); *Avoyelles Pa.*: Camp Plauche, 3 May, F. N. Young Coll. (1 male, 1 female, MCZ); *Cameron Pa.*: Cameron, 2 mi NW Holly Beach, 15 April 1976, A. Smetana (1 male, CNC); 14 April 1976, A. Smetana (2 males, 3 females, CNC); *Concordia Pa.*: Concordia, 5 mi W Ferriday, 1 May 1976, A. Smetana (1 male, CNC); *East Baton Rouge Pa.*: Baton Rouge, 27 February 1894 (1 female, CNC); *Harahan Pa.*: at light, 9 August 1944, H. Dybas (3 males, FMNH); 20 August 1944, H. Dybas (2 males, 2 females, FMNH); 26 July 1944, H. Dybas (1 female, FMNH); Harahan, 31 July 1944, F. G. Werner (1 female, MCZ); 26 June 1944, F. G. Werner (1 female, MCZ); 15 May 1944, F. G. Werner (2 females, MCZ); Hanrahan, Jefferson Park, 26 July 1944, H. Dybas (1 male, 5 females, FMNH); *Jefferson Pa.*: New Orleans, 29 May 1948, M. Gazier (1 male, AMNH); 17 June 1938, H. Dybas (1 male, 1 female, FMNH); *Lafayette Pa.*: Lafayette, 24 July 1973, W. Rosenberg (1 female, USNM); *Plaquemines Pa.*: Myrtle Grove, Orlando Park Genl. Coll. (1 male, 2 females, FMNH); Plaquemines Parish tide, H. O. nest under can on water hyacinth, 10 November 1976, W. Suter (1 male, FMNH); *Rapides Pa.*: Calcasieu, Choupique Bayou, 7 mi N Hackberry, 15 April 1976, Smetana (2 males, 5 females, CNC); 16 April 1976, A. Smetana (7 males, 10 females, CNC); 2 mi W Sulphur, 13 April 1976, A. Smetana (2 females, CNC); *Tangipahoa Pa.*: Tangipahoa, 8 mi S Hammond, 9 April 1976, A. Smetana (1 male, 1 female, CNC). **Maryland**: no locality (1 female, FMNH); Luger (1 male, CNC). **Mississippi**: no locality, F. Psota Coll. (1 male, FMNH); *Hancock Co.*: Waveland, 7 April 1976, A. Smetana (2 males, CNC); *Harrison Co.*: Landon Newman Lumber Company, UV light trap, 17 June 1968, D. H. Chandler (1 male, 1 female, FMNH). **New Jersey**: *Morris Co.*: Lincoln Park, 14 July 1948 (1 male, CNC). **North Carolina**: *Hoke Co.*: Southern Pines, 1925, Casey (1 male, 1 female, MCZ). **South Carolina**: *Charleston Co.*: The Wedge Plantation, South Santee R., 7 mi N of McClellanville, June 1977, E. G. & I. Munroe (1 female, CNC). **Texas**: no locality, 1925, Casey (4 males, 1 female, MCZ); 1925, Casey Coll. (3 females, USNM); 1919 (1 female, MCZ); (2 males, USNM); Liebeck Coll. (1 female, MCZ); *Angelino Co.*: Lufkin, 1 April 1969, D. J. Kuyper (1 male, FMNH); *Aranas Co.*: Goose Island State Park, 2 mi NW Rookport, black light on bench near marsh, 1 June 1968, L. Herman (1 male, AMNH); *Bexar Co.*: San Antonio, 8 April 1959, J. F. Lawrence (1 male, MCZ); at light, 2 July 1946, V. Dropkin (1 female, FMNH); *Brazos Co.*: 4 April 1959 (1 female, FMNH); College Station, 6 October 1974, J. S. Ashe (1 male, FMNH); 19 October 1973, student coll., J. S. Ashe (1 female, FMNH); 14 October 1973, J. S. Ashe (4 males, FMNH); at light, 5 October 1973, J. S. Ashe (1 male, FMNH); 3 May 1974, J. S. Ashe (1 male, FMNH); *Brewster Co.*: Boquillas, 7 July 1948, C. & P. Vaurie (1 male, AMNH); *Cameron Co.*: Brownsville, E. S. Ross (1 male, CASC); 1–3 August 1968, H. & A. Howden (1 female, CNC); 10 December 1960 (1 male, 3 females, CNC); November 1942, E. S. Ross (1 female, CASC); October 1942, E. S. Ross (3 females, CASC); 2 October 1942, T. M. Burns (1 female, CASC); October 1943, E. S. Ross (1 female, CASC); 11–16 June 1938, Darlington (2 females, MCZ); at light, E. S. Ross (1 male, CASC); *Comal Co.*: New Braunfels, 13 June 1927, P. J.

Darlington Coll. (1 male, MCZ); *El Paso Co.*: Fabens, light, 7 June 1956, H. & A. Howden (1 female, CNC); *Hidalgo Co.*: Benston State Park, 18–24 March 1972 (1 male, 1 female, FMNH); *Houston Co.*: 11 mi E Ratcliff, 24 April 1976, A. Smetana (1 female, CNC); *Kenedy Co.*: Armstrong, King Ranch, 10 September 1960 (1 male, 1 female, CNC); *Kerr Co.*: Kerrville, light, 23 July 1956, H. & A. Howden (1 female, CNC); *Nacogdoches Co.*: Nacogdoches, 15 October 1967 (1 female, FMNH); 22 April 1960, entomology class (1 female, FMNH); 8 May 1962 (1 female, FMNH); 15 April 1960, entomology class (1 female, FMNH); 14 April 1960, entomology class (1 female, FMNH); 25 April 1970 (1 male, FMNH); at light, 15 April 1960, entomology class (1 male, FMNH); *Orange Co.*: Orange, 20 June 1949, W. C. Stehr (1 female, CNC); Bridge City, 18 April 1976, A. Smetana (3 males, 1 female, CNC); 1 mi SW Bridge City, 18 April 1976, A. Smetana (1 male, 2 females, CNC); *Panola Co.*: Carthage, 8 May 1952, Cazier, Gertsch & Schrammel Coll. (1 male, 1 female, AMNH); *San Patricio Co.*: Lake Corpus Christi, 3 mi S Swinney Switch, 22 August 1974 (2 females, FMNH); Welder Wildlife Ref. nr Sinton, 19 May–9 June 1974 (1 female, CNC); taken at light, 4–7 August 1963, H. F. Howden (2 males, CNC); *Travis Co.*: Austin, 28 April 1950, H. T. Spieth (1 male, AMNH).

Acknowledgments

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American Museum of Natural History, New York (AMNH)
California Academy of Sciences, San Francisco (CAS)
Canadian National Collection, Ottawa (CNC)
Field Museum of Natural History, Chicago (FMNH)
Florida State Collection of Arthropods, Gainesville (FSCA)
Museum of Comparative Zoology, Cambridge, Massachusetts (MCZ)
United States National Museum, Washington, D.C. (USNM)
Zoologisches Museum, Museum für Naturkunde der Humboldt-Universität, Berlin, DDR (ZMHU)

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